Inside: CW Special Report on I/O

COMPUTERWORLD

THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

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NEWSPAPER

Wang Pulls ADMS Software As Users Decry Series of Snafus

By Lois Paul
CW Staff

LOWELL, Mass. — Wang Laboratories, Inc. last week announced it is withdrawing its Advanced Data Management System (ADMS) from the market in the wake of complaints from users who say they have been struggling with the software since it was shipped about three months ago.

The ADMS users have been plagued by a series of problems, they told *Computerworld* (see story on Page 8). Chief among these are the need for separate backup, in addition to regular disk file backup and the redefining of disk Volume Table of Contents areas for ADMS use.

ADMS runs on Wang's VS series of minicomputers. As a set of extensions to the Wang VS operating sys-

(Continued on Page 8)

Airline DPers Feeling Uneasy About Their Jobs

By Tom Henkel
CW Staff

The decision by the Federal Aviation Administration to restrict commercial flights to 75% of their normal level at least through April 24 appears to have brought an uneasy calm to some airlines' DP departments.

Because there are fewer flights to schedule since the air traffic controllers' union went on strike, there are fewer reservations and hence less of a burden on airlines' computer systems.

As a result, some airlines have already announced that DP workers will join hundreds of other airline workers who have been laid off. Other airlines, while they have not yet cut back their DP staffs, admit they are seriously considering doing so.

TWA, for example, one of the na-

(Continued on Page 4)

'Hero' Said to Best TSO In Programmer Support

By Jeffry Beeler
CW West Coast Bureau

SUNNYVALE, Calif. — Users of IBM and IBM-compatible mainframes can reportedly boost their programming efficiency fourfold to sevenfold with a system software product now available from a two-year-old Silicon Valley company.

Hero, an interactive program development and debugging system, enables an IBM 3033, for example, to support as many as 250 to 400 programmers simultaneously, according to a spokesman for The Software Authority, Hero's supplier. Even at the upper limits of its programmer support, the system typically consumes no more than 40% of a 3033's total capacity.

Hero boasts several times more support capability than IBM's Time Sharing Option (TSO), which usually allows no more than 60 to 80 programmers to gain on-line access to a 3033 at the same time, the spokesman said. The TSO replacement also requires less processor overhead than its IBM counterpart, which typically consumes more than half of a 3033's capacity when 60 or more programmers are using the mainframe simultaneously.

In addition to supporting many more programmers with a lower overhead than TSO, Hero provides several secondary user features, including text-editing and word processing capabilities that aid in the preparation of user documentation. The system also supports 3270 series terminals, full-screen Ascii terminals and an interactive "command procedure" language that comes with a compiler and structured programming construct.

Intended primarily for computing

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ELECTRONICS UNDERWORLD

Feds Cap Smugglers' Pipeline Stretching From Silicon Valley to Soviet Union

By Christopher Simpson
Special to CW

LOS ANGELES — Federal authorities have uncovered a pipeline stretching from Silicon Valley across Europe and into the Soviet Union through which at least $8 million in high-technology goods was allegedly smuggled in the last three years alone.

But the man said to be responsible for building that pipeline will probably never see the inside of an American courtroom.

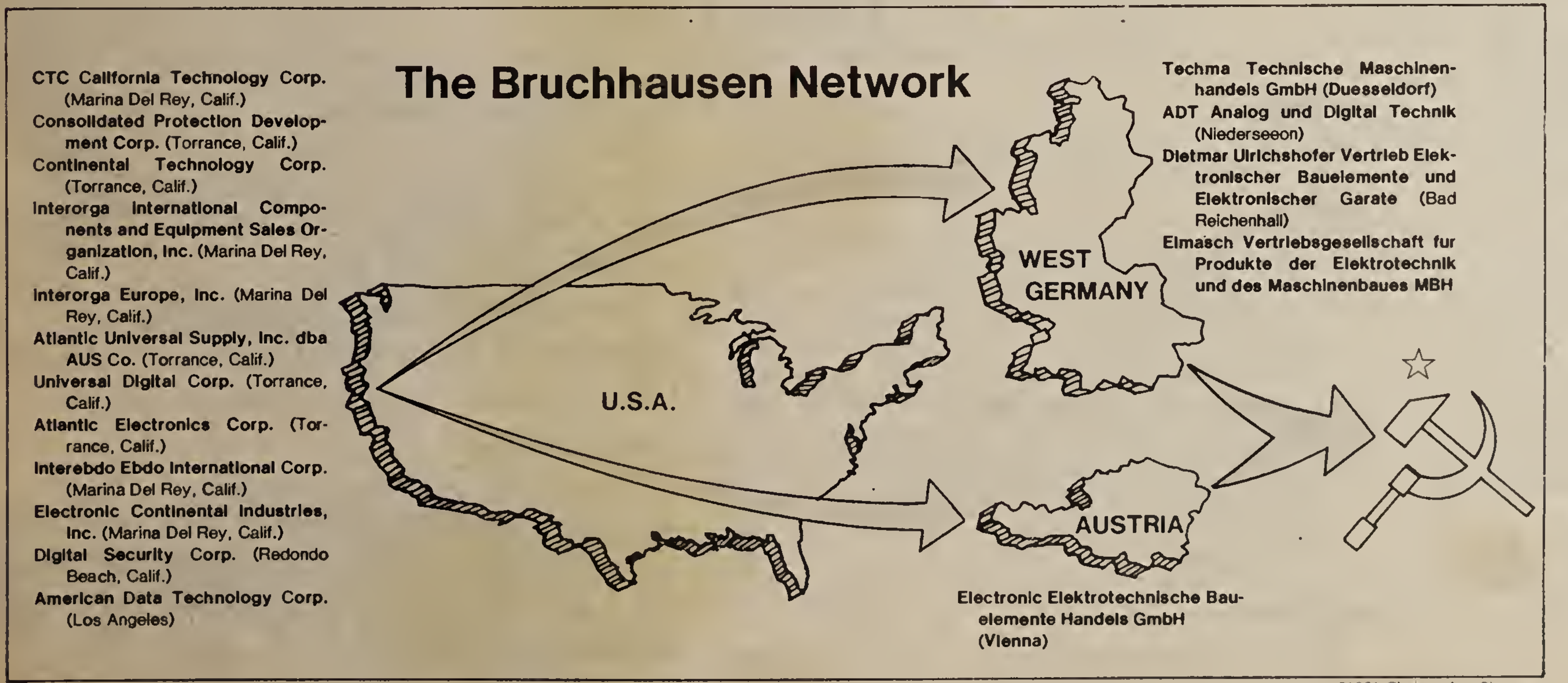
The pipeline was capped this month after a grand jury that was convened here early this year handed up a 60-count indictment against Werner Bruchhausen and three others [CW, Aug. 24]. The indictment followed an intensive 18-month investigation by federal authorities.

According to the investigators, a network of at least seven California companies fed the pipeline semiconductor manufacturing equipment, computers and classified communications gear. The companies were effectively shut down by the Commerce Department late last March.

Bruchhausen, the alleged kingpin in the smuggling operation, was last seen in Monaco this spring. It is unlikely he will ever be arrested because U.S. export control laws have no jurisdiction outside U.S. borders, and most European countries do not permit extradition of their citizens for U.S. export violations.

Moreover, *Computerworld* has learned, competition among U.S. law enforcement agencies eager for the credit of "busting Bruchhausen" may have sabotaged their best chance to put the man behind bars. The wide-ranging investigation, which was coordinated here by Assistant U.S. Attorney Ted Wu, included work by U.S. and

(Continued on Page 6)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Federal prosecutors charge that Werner Bruchhausen and three others created this network of companies in order to smuggle more than $8 million worth of high-technology equipment out of the U.S. between 1977 and 1980. Many of the companies had identical or overlapping directorships, worked out of the same offices or used the home address of officers (Source: California Secretary of State, U.S. Department of Commerce, U.S. Department of Justice).

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Users Say End to DP Personnel Shortage Begins With Improved Education System

By Marguerite Zientara
CW Staff

"Data processing people are demanding and getting higher salaries than their experience justifies. Companies are paying whatever it takes just to get someone — anyone.

"A concerted effort by someone or some organization (like *Computerworld*) to make our educational facilities more aware and to help improve the number and quality of new entries into the profession might help."

The perception that the DP turnover problem begins with education, voiced by DP Manager Sally B. Duff of EFB Truck Lines in Salt Lake City, Utah, echoed the sentiments of one-fifth of the respondents to a recent CW mail survey question asking for solutions to the turnover problem [CW, Aug. 17, Aug. 24].

The survey went out to 500 managers from CW's subscription list from all areas of the country, all sizes of installations and more than a dozen industries. The survey found overall that the departments of more than half the 313 managers who responded were operating below their optimum staffing levels.

About 42%, or 151 of the 313 survey respondents, answered the open-ended question, "Can you offer any solutions, either globally or for your own shop?" The largest percentage (19.2%) agreed with Duff that training, cross-training, college internship programs and more urging from counselors that students go into DP would help solve the demand/supply imbalance in the industry today.

While education may indeed be the first step in turning the personnel tide, once a DPer is hired, attractive salaries are felt to be the biggest factor in retaining DPers, according to the survey. Twenty of the 151 respondents (13.2%) mentioned salaries as the key to keeping workers.

"We pay top salaries for top people," replied Fred Rich, DP manager at Sierra Pacific Industries in Redding, Calif. "I prefer to have a few high-caliber people as opposed to a large staff of mostly mediocre competence."

Career pathing was the next most often cited solution to the turnover problem, mentioned by 14 managers, or 9.2% of the 151 who answered the question.

Three separate categories shared the next slot: good benefits; job content, challenge and enrichment; and respect and rewards for deserving employees as well as listening to employees' ideas. All three of those areas were mentioned by 11 managers each (7.2%).

"When people are treated honestly and fairly, they will remain employees. Set them an obtainable goal, give them the tools to reach it, reward them with what was promised and watch turnover decline" was the well-phrased advice of James E. Adams, manager of information services for Crown Foods, Inc. of St. Louis, Mo.

"Don't waste people's talents," was the succinct directive from Jonathan Watson, administrative DP coordinator for the Sidney Farber Cancer Institute of Boston.

"Tell top management [CEO & gang] that DP people are interested in the organization as a whole and do understand loyalty, business functions [bottom line] and we are not technical freaks," a manager of a Detroit paper distributor wrote. "Stop blaming DP for all the company ills!!" he added.

Providing a good environment was cited by 10 respondents (6.6% of the 151), and the remaining general categories — none of which received more than 5% response — were good management, considering individual interests and ability when making assignments and establishing management by objectives, regulating employment agencies, good documentation, good communication and employee participation in planning.

Terse Comments

In the area of regulating employment agencies, comments were terse: "Hang the flesh peddlers," "Nationwide boycott of unethical employment agencies" and "Get rid of head hunters."

Eighteen "miscellaneous" replies included calls for state-of-the-art technology in DP shops, user-friendly software facilities, use of high-level languages ("Application programmers must be brought down to earth regarding their real value") and careful selection of compatible workers ("One person who doesn't fit can ruin the entire shop").

"Make your DP staff take vacations and full weekends," was the advice of Monty Sasser, DP manager for Automatic Sales Co. of Portland, Ore., who felt DPers spend too much time on the job and receive too little compensation for the time they put in at work.

Judge Upholds Guilty Verdict In Fairchild vs. DG Antitrust Case

SAN FRANCISCO — A federal judge here has upheld the guilty verdict against Data General Corp. in the antitrust case brought by Fairchild Camera and Instrument Corp.

U.S. District Court Judge William Orrick rejected DG's motion to retry the case, in which the company was accused of engaging in antitrust activities in the DG-compatible minicomputer market. Orrick also refused to act immediately on DG's request that he hand down a favorable ruling in the trial, in spite of the jury's verdict.

The jury agreed with Fairchild's contention that DG packed sufficient economic muscle to violate U.S. antitrust laws. The case's next phase, which will cover the damages portion of Fairchild's suit, is tentatively set to begin this fall. Further legal wrangling by DG, however, could set the trial date back indefinitely.

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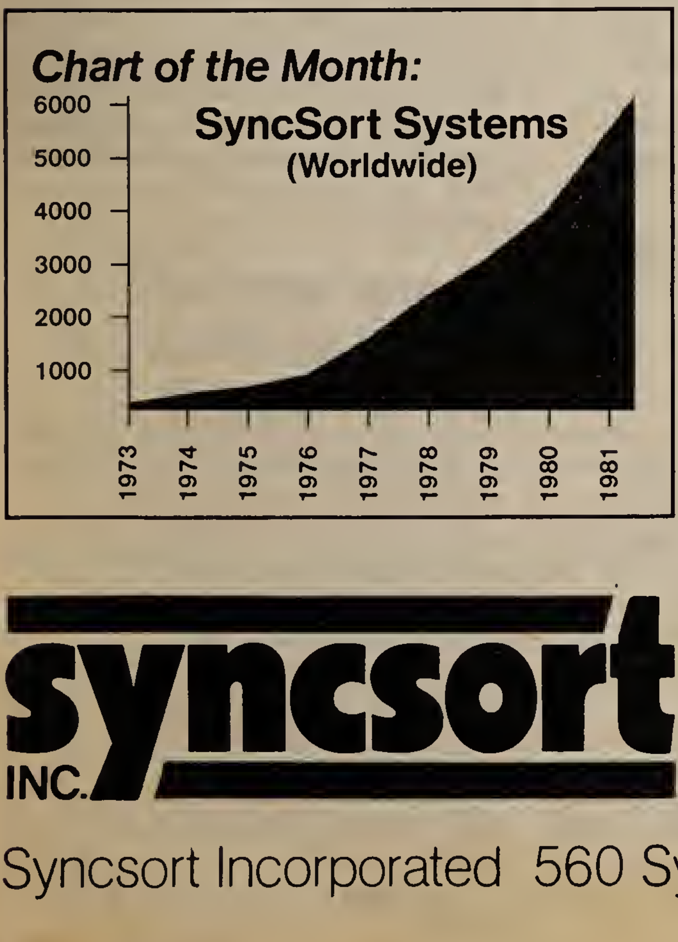

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Ford Exec: A Degree Does Not a DP Manager Make

By Brad Schultz
CW New York Bureau

DEARBORN, Mich. — The role of DP manager calls for a blend of technical and managerial expertise. Mayford Roark discussed that blend with *Computerworld* recently. As Ford Motor Co.'s executive director for systems, Roark manages more DP than almost anyone in American business.

According to Roark, universities and colleges cannot adequately prepare people for DP management in the sense that they prepare people for careers as physicians or attorneys.

A degree does not a DP manager make. Technical expertise is important, Roark said. "You've got to learn enough concepts or you'll be a slave to your subordinates," he explained. While much technology can be learned in the classroom, the art of management demands experience in the field, which schooling can only supplement.

Top Ford Executive

Roark has been Ford's top computing executive for 16 years. He is a management professional who became specialized in computing, rather than a technologist who gradually acquired management experience.

Roark majored in economics before World War II and then earned a master's degree in business administration. After a stint in the federal government following the war, Roark joined Ford at about the time computers were first applied commercially.

He had joined the budget bureau at the time computers were first applied in government. At Ford, Roark helped introduce the technology in the auto maker's finance department. Today, he manages 2,000 software applications in North America alone.

With this experience, Roark said he found that DP managers "need to talk in at least three directions: to technical people, to users and to top management."

The successful DP manager, he told CW, is "articulate and able to deal with concepts as well as people."

Computer Simulation 'Launches' Space Shuttle Into Flawless Flight

CAPE CANAVERAL, Fla. — The space shuttle *Columbia* blasted off from its launch pad and returned safely to earth here last week — without the aid of rockets and without even leaving the ground.

Using computers to simulate actual flight conditions, scientists and engineers at the National Aeronautics and Space Administration's (Nasa) Kennedy Space Center complex "launched" *Columbia* into the atmosphere as part of an overall system test.

Although results of the test are still being looked over by Nasa scientists, there were no problems during the computer-simulated flight.

The shuttle is scheduled to be rolled out to its launch pad sometime today in preparation for its second launch on Sept. 30.

The test was designed to simulate the shuttle's massive rocket engines, the stresses of lift-off and an emergency landing, according to Mark Hess, an official Nasa spokesman. The simulation involved the shuttle's launch processing system, a complicated setup consisting of eight autonomous launch processing sites, each of which has a network of up to 40 Modular Computer Systems, Inc. Model II/45 minicomputers.

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Airline DPers Uneasy About Jobs In Wake of FAA Flight Quotas

(Continued from Page 1)

tion's largest carriers, announced last week that it will lay off about 70 of its 830 workers connected with data processing. Sidelined workers will include data entry personnel and computer operators as well as some programmers and analysts, according to TWA's vice-president of computer and communications services, Jack Kennedy.

Braniff Airlines is laying off computer personnel as part of an across-the-board layoff of approximately 1,900 of its 11,000 employees. Most of the computer-related layoffs affect low-level employees, according to Norman McCue, staff vice-president of computer services. However, programmers and analysts that leave their jobs for other positions will not be replaced.

Spokesmen representing other airlines, such as U.S. Air and Eastern, told *Computerworld* some layoffs in data processing departments may result from flight volume reductions, but those layoffs are expected to be minor or restricted to part-time employees.

A Delta Airlines spokesman said no full-time employees will be laid off.

United Airlines will not announce until early September how many employees it will lay off. A spokesman there declined to say whether the data processing department would be affected.

Northwest Airlines Vice-President R.J. Glischinski reported that the volume reductions have had no impact on DP operations at the St. Paul, Minn.-based firm. Northwest has laid off 2,700 other workers, but Glischinski said no layoffs are expected in the DP department.

No Revisions

During the walkout by the Professional Air Traffic Controllers Organization (Patco), there have been no problems with or revisions to their internal computer systems, the airlines noted. Most said reservation systems were somewhat overworked during the first few days of the strike, but flight changes and cancellations have since stabilized, spokesmen reported.

Developing a schedule to meet the FAA's volume reduction requirements is the next hurdle facing the airlines. While none expected rescheduling to be a problem, the spokesman for one said getting scheduling information from other airlines has been somewhat difficult.

Another spokesman said some nonessential computer services may be cut after the Sept. 9 deadline to produce a new schedule.

Demands for information from top management have also slacked off. Since the FAA has restricted the number flights, there are fewer decisions to make, according to one spokesman.

Infodata Users Meet Slated for Nov. 8-12

MARCO ISLAND, Fla. — The 1981 National User Meeting sponsored by Infodata Systems, Inc. will be held here Nov. 8-12. The meeting is open to Inquire and IQ/net users.

Kicking off the meeting, an IBM speaker will discuss "Directions for the IBM 4300," followed by an Eastman Kodak representative examining "Computer-Assisted Image Processing." Also presented will be product updates, workshops, training sessions, a new feature called the User Information Center and special interest group sessions.

The $275 registration fee includes all workshops, sessions, breakfasts, lunches and two dinner receptions. Further details are available from Kathleen Condrey at Infodata Systems, 5205 Leesburg Pike, Falls Church, Va. 22041.

'Computerworld' TV Available From ASI

ARLINGTON HEIGHTS, Ill. — Advanced Systems, Inc. (ASI) has completed an agreement with CW Communications, Inc., publishers of *Computerworld*, to offer CW's TV news magazine series as part of ASI's Management Perspective Library.

Titled "Computerworld," the half-hour programs cover topics such as computers and air traffic control, robotics and the interplay of computers in everyday life.

Additional information on the release of the video offerings is available from ASI at 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.

Informal Survey Finds

Top DPers Want More Support From Top Brass

By Brad Schultz
CW New York Bureau

Top management should pay more attention to DP. It should, in many organizations, separate management of information from management of systems.

Computerworld heard that consensus from 14 DP executives last week. They run DP for four manufacturers, two firms in transportation, one in insurance, another in research, a savings and loan, a brewery, a retailer, a food processor, a textile printer and a federal hospital.

Systems planning is too important to be left to systems experts, several systems experts told CW in telephone interviews. A company's president and division chiefs — not programmers and systems analysts — are ultimately responsible for translating corporate objectives into systems development specifications, the polled DP managers explained.

While user line managers must play a direct role in fitting systems to user needs, an organization's highest echelon of administrators include the only people generally able to judge whether major systems development is worth undertaking.

Top Management

Only top management, the survey respondents said, can tell the DP executive whether the organization can afford proposed development, whether user priorities will change and what will be relevant corporate policy.

Requesting anonymity, the DP executive for a large diversified manufacturer in San Francisco said top management should "force" all operating units to declare strategic plans. The DP section, he explained, must know these plans to anticipate need for applications revision, systems upgrades, alteration of data communications and shifts in usage volumes.

"Sudden surprises [in long-range systems planning] are not good for anyone," agreed Winfred Applegate, director of management information systems (MIS) at Belding Heminway, Inc. in New York. Any DP staff requires a significant lead time in which to write software that satisfies needs users say they have.

Abrupt changes in users' systems specifications "are especially disheartening to the more creative members of a technical group," Applegate observed.

At Texas International Airlines in Houston, Jim Goodlett, vice-president of systems, weaves a large web of on-line data bases that pose intricate security problems. "I'm caught in the same tussle many companies are in," he told CW, "which is how to satisfy users as the technology changes rapidly."

Goodlett said user-supplied descriptions of how to control data base access have proven inapplicable at his company.

Many Texas International users share the same data, but reportedly do not appreciate each other's access requirements or problems that Goodlett's staff faces in trying to please all users at once.

"Top management is not helping with this problem," Goodlett stated.

A bare majority of the polled DP managers indicated that information resources management (IRM) — which separates information management from systems management — would be appropriate for their organization.

Several respondents said their top management lacked enough "sophistication" to see why they could benefit from IRM. Others said IRM would benefit certain kinds of organizations, but not theirs.

Applegate said his company was too small for IRM. At Broadview Savings and Loan in Cleveland, William Halliday, MIS executive, said that whoever held his job should manage information as a resource in its own right along with systems.

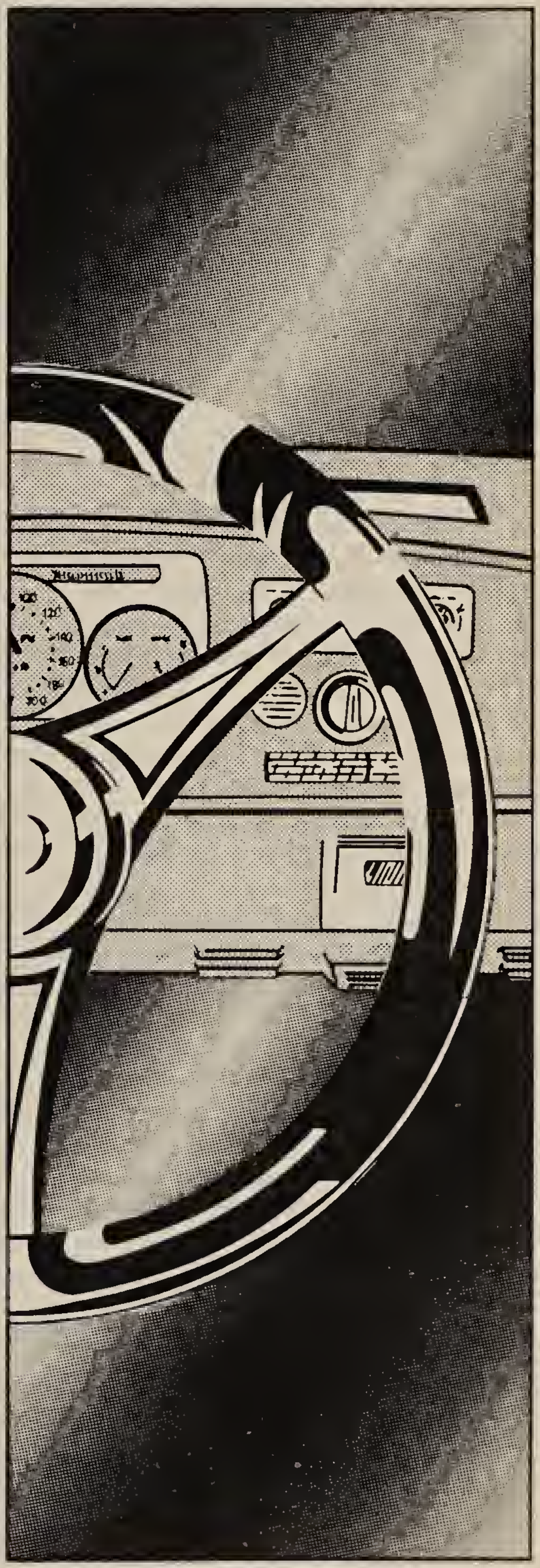
Depends on DPers

At Cranston Print Works in Cranston, R.I., Leonard Heier observed that IRM's applicability depends on who runs DP. Some computing executives can handle responsibility for effectiveness of information — not merely efficiency of information systems — and others cannot, he remarked.

At SRI International, Inc. in Menlo Park, Calif., Herbert Lechner, director of DP, said IRM would be inappropriate at his research company because most of its 3,000 employees "have excellent computing skills." They can easily tell his department what they want from systems, he explained.

At Kaman Sciences, a high-technology manufacturer in Colorado Springs, Colo., Richard Smith, DP vice-president, said systems management should be separated from information management.

The difference is analogous to that between accounting and finance, he pointed out. One function is operational, the other requires a global view from a high place in the corporate hierarchy.



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(Continued from Page 1)

West German Customs, the Departments of Justice and Commerce and the Internal Revenue Service.

Besides those handed up against Bruchhausen, indictments for a broad range of smuggling, conspiracy and tax evasion charges were handed up against:

- Anatoli Maluta, a Russian-born naturalized U.S. citizen whose security company, the Consolidated Protection Development Corp. in Torrance, Calif., is alleged to have been a key factor in the smuggling scheme. Maluta, a former U.S. Air Force intelligence officer, once enjoyed a "Top Secret" security clearance.
- Sabina Dorn Tittel, a West German national who is listed with the California secretary of state as a director of at least six corporations allegedly used in the smuggling scheme.

Both Maluta and Tittel were arrested in Los Angeles and subsequently released on bond.

- Dietmar Ulrichshofer, a director of Ulrichshofer Vertrieb Elektronischer Bauelemente und Elektronischer Garate in West Germany and Electronic Elektrotechnische Bauelemente Handels Gesellschaft GMBH in Austria. Charged with conspiracy, Ulrichshofer is believed to be living in Austria.

'Completely Preposterous'

Prosecutors charge that Tittel instructed employees to claim that high-technology electronics bought in California were headed for Maluta's security business outside Fort Huachuca, Ariz., when in fact they were destined for East Germany and the Soviet Union. Both Tittel and Maluta have been charged with violations of the Export Control Act, the Arms Export Control Act and tax evasion; Maluta faces an additional charge of perjury. If convicted, the two face substantial fines and jail sentences.

Maluta's lawyer, Carl Capozzala, said that many of the counts against his client are "completely preposterous." He insisted that "the government's claim that Maluta had knowledge that goods were shipped to the Soviet Union is completely without foundation," pointing out that proof of intent to violate export regulations is necessary if Maluta is to be convicted.

"The government is filing whatever charges they can think of. It's obvious that they are taking out their frustrations on Maluta as a result of the escape of Bruchhausen."

Although Capozzala concedes there may have been some "technical violations" of complex trade regulations, Maluta has pleaded not guilty to all counts.

Tittel, who has also pleaded not guilty, could not be reached for comment.

How Scheme Worked

According to the indictment, the alleged conspiracy began at least as early as January 1977, when Maluta and Tittel met with a freight forwarder to arrange regular shipments of electronics to West Germany.

The shipments were to be handled by Interorga, a company founded by Bruchhausen and Maluta. Tittel allegedly claimed that no export licenses were needed for the equipment they intended to ship.

During the next three years, Bruchhausen, Maluta and Tittel used at least three corporations they had founded to procure high-technology electronics from leading U.S. manufacturers. The corporations were Continental Technology Corp., CTC California Technology Corp. and Consolidated Protection.

The goods were transferred to at least three other U.S.-based Bruchhausen-Maluta corporations — Interorga, Atlantic Universal and Universal Digital — for export to yet another set of corporations controlled by Bruchhausen in West Germany and Austria.

Many of these companies had identical or overlapping directorships, worked out of the same offices near Los Angeles International Airport or used Maluta's or Tittel's home as their business address. In some cases, Maluta used both his own name and an alias, Tony Metz, to make up the list of directors of a new corporation.

In what was apparently an effort to avoid certain export reporting requirements, the electronics shipments to Germany were often declared to have absurdly low values in export documents. According to the grand jury, the items were generally labeled "meters," "hybrids" or "electrical meters" in the official paperwork that is required to accompany overseas shipments.

At the West German end of the pipeline, still other companies owned or controlled by Bruchhausen and Ulrichshofer took over. These companies allegedly repacked a shipment or provided it with new export papers. In addition to the companies run by Ulrichshofer, Bruchhausen also controlled Techma Technische Maschinehandel GMBH and ADT Analog und Digital Technik.

The final stop in the pipeline before it disappeared into the East Bloc was often Elmasch, a company formed by Hans Juergen Koenig, a former Bruchhausen employee and unindicted coconspirator in the scheme. The main purpose of that company, as prosecutor Wu put in, was "obtaining U.S. origin high-technology commodities for Soviet Bloc countries."

Pipeline Begins to Crack

The pipeline began to crack as early as April 1979, when a U.S. Department of Commerce agent questioned Maluta about the final destination of a recently ordered Perkin-Elmer Co. Micralign semiconductor manufacturing device. Maluta professed his innocence and canceled the sale.

But such inspections, it seems, only boosted the price Bruchhausen demanded from the Soviets. By January 1980, Maluta was to cable Bruchhausen to "get plenty" for a Gasonics Corp. High Pressure Oxidation System he was preparing to export because, according to Maluta's telex, Gasonics was "very interested in where this equipment is going to wind up eventually . . . [We] may even have a Perkin-Elmer here."

Meanwhile, disk drives, integrated circuits (IC), printers and integrated circuit test systems were all allegedly exported without trouble first to West Germany and then on to the East Bloc.

Another crack appeared in late 1979, when Maluta reportedly approached Fairchild Camera and Instrument Corp. with a plan to purchase two perimeter defense systems of the type Fairchild supplies to the U.S. Strategic Air Command. According to law enforcement sources, Maluta claimed to represent two West German Air Force bases seeking the security systems. The scheme came apart, however, when Maluta allegedly offered cash and suggested that the systems be sent to a post office box in Vienna, Austria. Fairchild canceled the deal.

Maluta, Bruchhausen Quarrel

By early 1980, a formal federal investigation had begun. Thousands of dollars worth of electronic equipment allegedly shipped by Bruchhausen and Maluta was seized by the Customs Service on a Soviet freighter docked off San Pedro, Calif. Search warrants were executed against Continental Technology Corp., a bank safe deposit box rented by Bruchhausen, and eventually against the homes of Maluta and Tittel.

Although Continental remained in business for at least six months after the raids, the handwriting was on the wall. Bruchhausen left the country abruptly in mid-March 1980 following a bitter argument with Maluta.

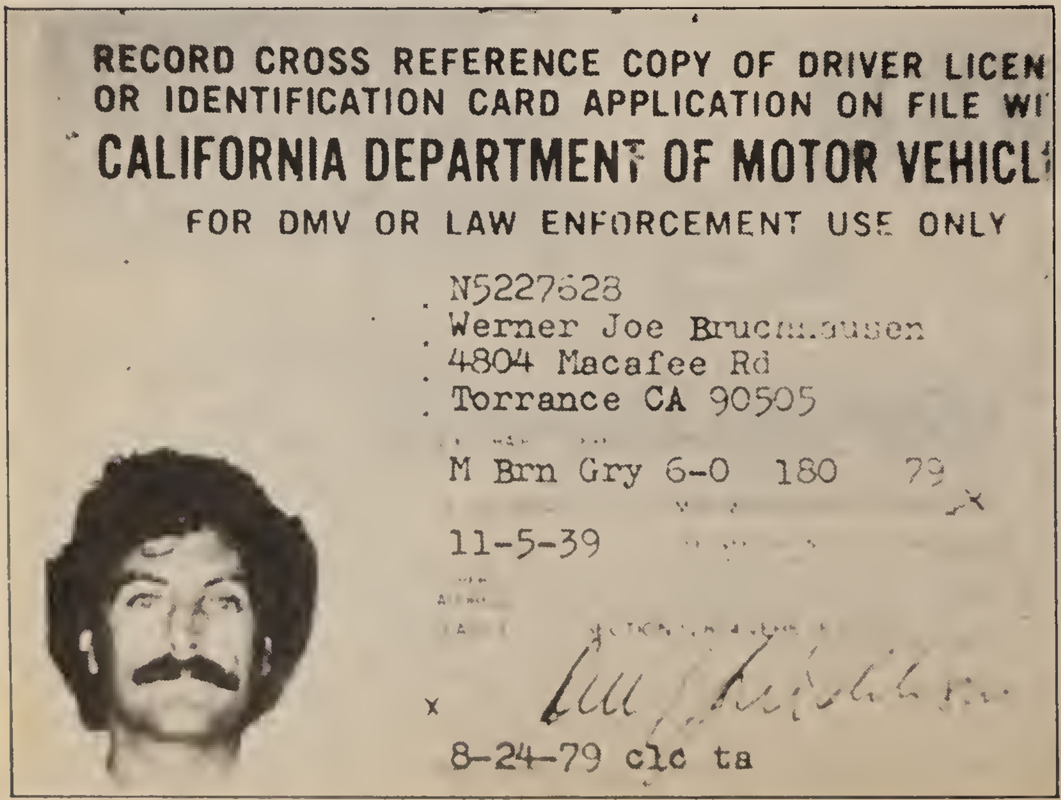
The Booty

The booty shipped to West Germany for transshipment to East Germany and the USSR during the past three years reportedly included:

- At least three Watkins-Johnson Co. mainframe microwave receivers, Models MF-100 WJ 940 and 1240, with RF heads, tuning heads and interconnecting cables. Valued at approximately $100,000 each, these are Munitions List items and have classified communications applications.

Other microwave communications equipment allegedly exported without proper licenses include a Narda Microwave Co. microwave amplifier and two Watkins-Johnson model WJ-8640 Manpack Receiver Systems. These are also Munitions List items.

- At least six Fairchild Camera and Instrument Corp. Xincom semiconductor memory test systems. Most of the Models 5580 and 5581 systems, valued at approximately $160,000 to $200,000 each, went to the USSR, though two are alleged to have been transhipped through the Netherlands to East Germany.
- At least two Data General Corp. Eclipse S/230 computer systems valued at approximately $135,000 each. Destination: USSR.
- Peripherals including a Memorex Corp. disk drive system valued at $161,032.50 and a Tamarack Scientific Co., Inc. Model 142 contact printer. To East Germany.
- A Model 7000 drafting system made by California Computer Products, Inc.
- Microcircuits from Intel Corp., Motorola Semiconductor Products Group and Analog Devices, Inc., allegedly shipped to the USSR. In addition, the Soviets were allegedly able to obtain Rockwell Corp. bubble memory devices and mil-spec circuits through Bruchhausen.
- Test equipment, including a Siemens Corp. Model HT 500C computer head disk analyzer system allegedly shipped to Bulgaria; unspecified Intel microcomputer development systems shipped to the USSR; and a Tektronix, Inc. Oscilloscope and Time Domain Reflectometer allegedly shipped to East Germany.
- Gasonics, Inc. Model 5025 Hipox high-pressure oxidation system valued at $145,648.18.



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Free in Monaco, Bruchhausen may never see the inside of a U.S. courtroom.

Flowed in Pipeline From Silicon Valley to Soviets

Both Maluta and Tittel resigned from Continental, although they have maintained their directorships of other corporations such as the Consolidated Security Development Corp.

Law enforcement sources familiar with the federal investigation claim that Maluta and Tittel "ripped [off] Werner for more than $350,000" during this period by draining assets from Continental and other Bruchhausen pipeline companies. Attorney Capozzala, speaking for Maluta, denied the charge.

Ironic Coincidence

As Customs and Commerce Department investigators were closing in on Bruchhausen's alleged export control violations, local police in Santa Clara County stumbled across his name almost by coincidence. Ironically, it seems as though this local investigation has come the closest to establishing the sort of chain of evidence for an extraditable crime necessary to make charges stick against Bruchhausen.

Santa Clara County sheriff's deputies led by Lt. Robert McDiarmid had been tracing microcomputer chips stolen from Silicon Valley manufacturers since December 1979. A prime suspect in the investigation was Roger Pitkin, president of Santa Clara-based Quest Electronics. (Pitkin recently made a no-contest plea to charges of trading in stolen integrated circuits.)

During September 1980, Pitkin was approached by Deputy Sheriff Wayne Brown, who was working undercover as a dealer in "hot" microcomputer chips. Pitkin was eager to buy.

Pitkin wanted ICs for his "German connection in Monaco," according to Brown's sworn statement, now in court records. He offered Brown $10,000 for 1,000 unmarked Intel 2732 chips.

Brown took the ICs to Pitkin, and Pitkin took them to San Francisco Airport. Their destination: ADT, Bruchhausen's West German purchasing company. (A later search at Quest Electronics revealed telex messages between Pitkin and Bruchhausen and a $90,000 transfer from Bruchhausen to a Sunnyvale bank — a transfer that McDiarmid alleges was used to purchase stolen IC's).

Once the Sheriff's Department realized that the ICs were likely to be exported without required Customs clearance, it notified the Customs Service, which joined the investigation. Customs was on the scene at the airport when Pitkin shipped the 2732s.

The original agreement between the Sheriff's Department and Customs was that the "chips were to be tracked through Europe," according to one source familiar with the investigation who refused to permit his name to be used. "Receiving stolen property would be a violation over there, and that's why we wanted to track it. The Germans would have a case and the attorney general would have a case: goddamn certified stolen property, no question about it."

It was also hoped that it might be possible to use Pitkin in an undercover capacity after his arrest in order to nail Bruchhausen, according to Doug Southard, the Santa Clara County assistant district attorney who was eventually responsible for prosecuting the case.

The news media was to be kept in the dark about developments, according to the agreement between the agencies. At least one newspaper, the *San Jose Mercury News*, which had begun its own investigation of Quest, agreed to withhold coverage of the story temporarily while police pursued the European connection.

But as investigators were closing in on Pitkin for an arrest, "Customs brought along a 'photographer'," an eyewitness said. "They all said he was a really great guy. He turned out to be their public relations guy . . . the Customs Service had their press release all ready.

Electronics Underworld

"Customs had had a lot of adverse publicity back East, and they were told that it might behoove them to get something really good."

Soon "it was clear that the media had a pretty good idea of what was going on," Southard said. "It [became] impossible to use Pitkin undercover because the case was all over the press."

Meanwhile, West German Customs came under pressure from the U.S. government, which feared that the sophisticated chips might be diverted to the Soviet Union. West German Customs seized the shipment of stolen 2732s when they were picked up by the freight forwarder — but before they were delivered to ADT and Bruchhausen.

"Now, the West Germans don't have a case [against Bruchhausen]," Southard confirmed.

Trade Prohibited

Today, U.S. trade with Bruchhausen's companies Techma, Ulrichshofer Vertrieb and Electronic Elektrotechnische Bauelemente GmbH has been shut down by order of the

(Continued on Page 9)

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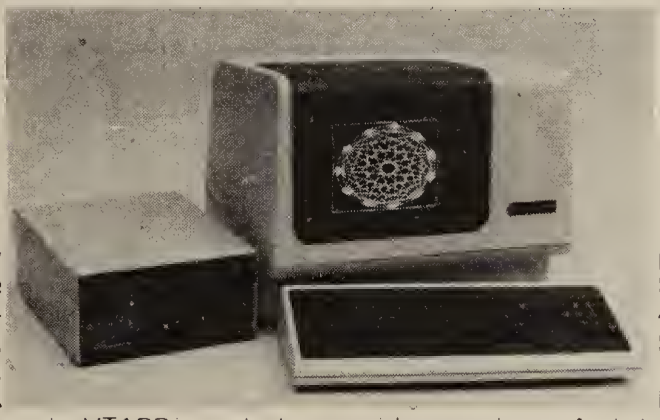

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Wang's Step Toward DBMS Stumbles

Users: ADMS Created, Not Solved, Problems

By Lois Paul
CW Staff

Wang Laboratories, Inc. intended the Advanced Data Management System (ADMS) as another step toward a true data base management system, but the software apparently created rather than solved problems for its users.

Contacted by telephone last week, 15 users of Wang's VS operating system said they received the free ADMS option, but only two have been able to implement it. Many said there are problems with Release 5 of VS itself.

"There are problems with the release, period," Bill Wacker, DP manager for Resorts International in Atlantic City, N.J., said. He noted that Wang has been working on correcting problems. "Every week we get another little blurb with another little patch, another fix."

Hank Berkley, assistant vice-president of Berkley Holding Corp. in Greenwich, Conn., has implemented the software as part of a multimillion-dollar development program his software house is undertaking. A major problem has been response time, according to Berkley and other users.

"The only thing they really did wrong with ADMS is . . . that they cheated a little bit," he said. "On the disk Volume Table of Contents [Vtoc], with certain ADMS control files the user doesn't have access to, [for example] audit trails, they took the disks which are normally reserved for record lengths or key areas and redefined them for ADMS use."

This means that a standard utility, such as backup, cannot figure out what to do on the system, he said. "That is really a question of poor judgment, taking a Vtoc that has standard type entries and reformatting them."

When asked about this problem with ADMS, Charlie Johnson, Wang's director of product line management for business computer systems, said, "Those types of things are some of the reasons we decided it was not the user-friendly system I think Wang Labs has been known for. It sounds like it was probably a problem with the first release of the software."

Berkley said this flaw in the software is causing him problems and he currently is attempting to program around it. He has been satisfied with Release 5 of VS itself.

The data independence feature of ADMS is "useless," Berkley said, unless you have a big DP shop. His company will not be using this feature and will be programming around it.

The backup recovery feature of ADMS is very useful, he added, and is something he wants to use in the large project he is undertaking.

"It gives you the ability to logically group a full bunch of updates and perform them as a single transaction so if the system fails or the program fails or anything happens in the middle, you can back out that transaction or that partially completed transaction and maintain a consistent data base," he explained.

Berkley's company develops software for IBM and Wang systems. "I get blamed all the time because DOS/VSE doesn't run or Vsam has bugs in it and our sofware doesn't perform because of Vsam bugs," he said.

"If you compare Wang's Release 5 of VS with a release of IBM's DOS or any other operating system, it is really terrific," Berkley added. "Certainly compared to software that comes out of Digital Equipment Corp. or Data General Corp. or any of the other comparable vendors, there really is no comparison," he said.

Phil Dowlin, coordinator of DP for Natural Gas Pipeline in Houston, is the only other user who reported implementing ADMS. His company implemented ADMS with a purchase contract system, but decided recently not to use it because of problems with the software.

Basic Problems

"The basic problems are the backup features and the maintaining and use of those backup files," he said.

A separate backup is necessary with ADMS, in addition to regular backup, according to Dowlin. "Therefore, we have to run two backups on our files. Then we cannot reuse the file if it is being backed up to another disk. We can't use it as a backup file. We have to restore it before we can reuse it."

Berkley confirmed this problem, but noted that ADMS requires a logical backup, rather than a physical disk file backup, and this is tied directly to its automatic recovery feature. "It is kind of a pain. You can't have one backup for everything, but on the other hand you can see why they couldn't do it."

Wang's Johnson denied that a separate backup is necessary. "It simply conformed to any good design criteria," he said.

Barbara Munger, systems manager of Foster Wheeler Energy Corp. in Houston, feels her site has "been cut off at the pass. They have [first] informed us that ADMS is full of bugs and [second] they won't support a customer unless that customer currently takes a one-week class up in Boston, which really is a way of cutting everybody off."

Munger's shop has ADMS, but is not using it. "The reason we don't use it is because it doesn't do anything. It doesn't relate files together at all." She said it is a schema, subschema-type approach that can be called from a program.

ADMS for Wang VS Pulled Off Market

(Continued from Page 1)

tem's Data Management System (DMS), ADMS has been considered a second step toward an eventual data base management system (DBMS). It was announced in January 1980 as a free option with Release 5 of the operating system, but was not actually released to users until May or June of this year.

Frederick A. Wang, the firm's senior vice-president for development, said the major problem with ADMS has been a change in the market in the two years since the software was "speced out."

"We judged a market two years ago, and the market changed," Wang said.

Aside from short-term bugs reported by users, ADMS did not appear to be addressing the marketplace at which the vendor was aiming, Wang said. "It didn't really address the issues of data management that we had originally expected it to," he added. "The differences between what we originally wanted for an ADMS and a true DBMS are really fairly minimal."

Users currently implementing ADMS can use DMS in the interim, Charlie Johnson, director of product line management for business computer systems, said.

"We are negotiating with an outside DBMS company to have available a full DBMS within six months and we are also working long-term on our own product that will accomplish the merger of both structured data, typical DP data, as well as text, voice and graphics," Johnson said. There are between five and 12 customers using ADMS in production, according to Johnson.

Wang said the company has been withdrawing the software for some time. "Some of the people have heard sooner than others. As we are withdrawing the product, we want to discourage further activity with it before we find that we are going to get more customers into a situation we don't want."

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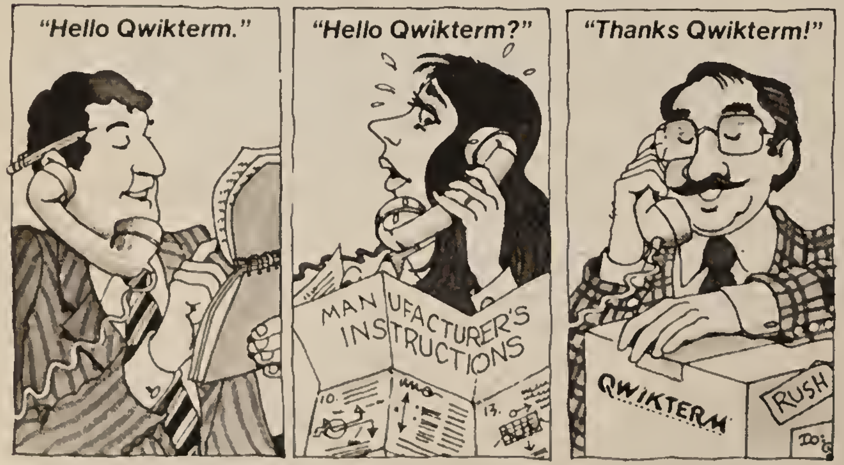
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TSO Competitor Claims to Boost Programming Efficiency 700%

(Continued from Page 1)

shops where batch and interactive program development environments coexist, the system operates with any medium- or large-scale IBM or IBM-compatible processor running under MVS. Two additional Hero releases — one capable of running under VS1 and the other under DOS — are expected to be announced during the second and fourth quarters of 1982, respectively.

Hero and its main competitor, TSO, differ primarily in their addressing scheme. While the IBM system assigns each user to a different address space, the Software Authority counterpart provides one large space that all users are allowed to share.

The common address space approach overcomes TSO's context-swapping problems and thus accounts for much of Hero's efficiency edge over the IBM product.

Hero is available under a graduated pricing structure that in effect makes the system's per-programmer price lower for large mainframes than for smaller ones. For an IBM 4331 Group I, the system's per-CPU charge totals $5,000; for a 4341 Group I and II class machine, $10,000; for a 3081-class processor, $28,500.

Hero under MVS is available for a prepaid perpetual license fee of $20,000/site, which also covers one year of maintenance and enhancements. First shipments of the system's initial release will begin in December from the Software Authority at Suite 214, 1270 Oakmead Parkway, Sunnyvale, Calif. 94086.

Survey Indicated Need for 'Hero'

By **Jeffry Beeler**
CW West Coast Bureau

SUNNYVALE, Calif. — Hero, a program development and debugging system for IBM and IBM-compatible mainframes, is the first product to be announced by The Software Authority, a privately held company founded in 1979.

Headed by former programmer and National Semiconductor Corp. alumnus David Alderman, the firm supplies systems software aimed at trimming the computing field's massive applications backlog and giving a much-needed shot in the arm to the industry's sluggish programmer productivity.

The demand for improved program development systems was underscored recently by The Software Authority's own survey of 46 user organizations, which altogether accounted for 119 medium- and large-scale CPUs.

At the time, the companies employed a total of 6,500 programmers, only 30% of whom were able to gain on-line access to their systems at any one time, the survey revealed. The respondents were also found to have an average application backlog of 2.99 years.

Emboldened by its survey results, The Software Authority acquired an incomplete program development and debugging system from a second vendor, brought the product to fruition and later announced it as Hero. Alderman declined to reveal the identity of the company where Hero was originally conceived.

Feds Put Cap On Pipeline

(Continued from Page 7)

U.S. Commerce Department.

The sweeping order, issued March 24, prohibits trade not only with Bruchhausen, Maluta, Tittel and several West German companies connected to them, but also bans business with their "agents and employees, successors and any person, firm, corporation or business" that might be related to them by "affiliation, ownership, control, position or responsibility or other connection."

Unfortunately, however, "there is just no simple way," as Commerce Department Compliance Chief Sharon Connely put it, for a company to determine today if it is violating the Commerce Department order by dealing with a Bruchhausen-linked business.

The Commerce Department, in fact, is often prohibited from publicizing the names of businesses involved in international trade and has refused requests for names of companies linked to Bruchhausen by "affiliation, ownership" and so on, beyond those mentioned in the order itself. Bruchhausen's ability to create new corporations out of thin air is, of course, well established.

In the meantime, ADT and Elmasch — the company that prosecutors charge was set up to obtain "U.S. origin high-technology commodities for the Soviet Union" — remain in business and are apparently able to trade with U.S. electronics companies without restriction.

Bruchhausen himself appears to be safe from prosecution, at least for the moment. Even Wu, the U.S. attorney now prosecuting Bruchhausen, Maluta, Tittel and Ulrichshofer here, admitted that "I don't believe that the extradition treaty covers export control and arms export control violations," particularly when such violations involve foreign nationals now on foreign territory.

The Justice Department has, however, obtained a bench warrant for Bruchhausen's arrest.

Simpson is a free-lance journalist based in Washington, D.C.

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Managers on the Move

PETER SCHEMENTI has been named vice-president of management information systems (MIS) at CBS, Inc. in New York.

Peter Schementi

Schementi joined CBS as systems manager in the controller's department, served as director of MIS in the CBS Records Division and then held the same position for the CBS television network.

He was named director of the CBS data center in 1975 and director of operations and telecommunications, MIS, in 1977. Since September 1980, he has been director of planning and administration, MIS.

A graduate of Providence College, Schementi holds a B.A. degree in economics.

•••

PAUL R. NASLUND has been appointed MIS director at Kitchens of Sara Lee in Deerfield, Ill. Naslund will be responsible for the administration and direction of all computer-related activities, including data center operations, systems development/programming and process control for Sara Lee plant computers.

Naslund brings to this post14 years of management experience, having served on the original team that installed the computer-based systems for control of the automated high-rise frozen warehouse and batch mixing control system at Sara Lee's Deerfield plant.

He attended Roosevelt College and is a member of the Society for Management of Information Services as well as the Data Processing Management Association.

•••

RONALD D.Y. UCHIDA has been promoted to vice-president, operations manager, at Mincomp Corp. of Englewood, Colo. Uchida is responsible for the general overseeing and direction of the firm's principal data processing operations. He also acts as administrator for the Earth Sciences and Education Divisions.

Prior to joining Mincomp in 1980, Uchida was a geophysicist with International Engineering Co. in Denver. He also worked as staff geophysicist and geologist at Woodward Clyde Consultants in Denver.

Uchida earned his degree in geophysical engineering from the Colorado School of Mines.

•••

KATHLEEN S. HALLGREN has been appointed director of the health and welfare data center for the Michigan Department of Social Services in Lansing, Mich.

Hallgren worked in the Michigan Department of Social Services as a programmer in 1972, became the director of the Technical Services Division in 1978 and is now the highest ranking data processing professional in the state government of Michigan.

Hallgren graduated Phi Beta Kappa in mathematics from the University of Nebraska at Lincoln.

•••

EARNEST J. EDWARDS has been named general manager, Alcoa management information systems, for the Aluminum Co. of America, based in Pittsburgh, Pa.

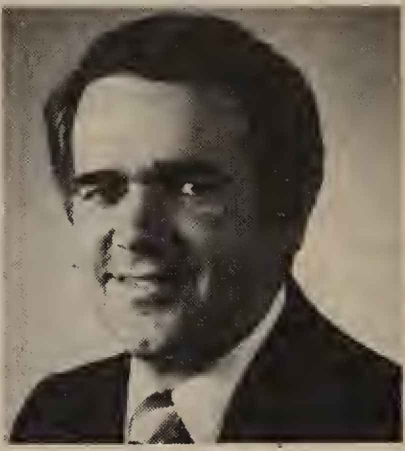
After joining Alcoa as a controllership trainee in 1965, Edwards was promoted to product accountant, foundries. He served in various accounting and cost accounting positions in Los Angeles and Pittsburgh.

Edwards is a graduate of Virginia State College and earned an M.B.A. degree from Duquesne University.

•••

HOWARD MILLER was recently appointed vice-president, director of MIS at Ponderosa System, Inc. He joined the company in July of 1979 as director of MIS.

He received a bachelor's degree from Duquesne University and a master's degree from Bridgeport University.



Paul R. Naslund

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Should a Systems Analyst Run New York?

By Bob Johnson
CW New York Bureau

NEW YORK — Can a systems analyst run New York City better than Mayor Ed Koch?

The Free Libertarian Party, the New York State affiliate of the national Libertarian Party, thinks so. It is running a DPer against Koch in November's mayoral election.

Judith Jones, a senior systems analyst at Philip Morris, Inc. here, pursues a dual career in computers and politics. Although a computer career may not appear to be the traditional path into politics, Jones said that computer professionals unofficially make up two-thirds of the Libertarian Party, which claims to be the third largest party in the country.

"Computer people tend to be very logical and individualistic people. This is essentially what the Libertarian Party is based on and I think that may be the reason so many DP pros are drawn to it," she said.

Libertarian Philosophy

A Libertarian since March 1980, Jones embraces the party's basic philosophy, which simply states that each individual has the right to exercise sole dominion over his life as long as the rights of others are also respected. She noted that DP people are very much like that, "They like to have their freedom and do their job."

Jones' work at Philip Morris coincidentally concentrates on a legislative tracking system called Gambit. The system, which runs under the Focus language, was tailor made for Philip Morris by Jones' group to check the status of congressional bills and international legislation directly affecting the company's interests.

A network of Hewlett-Packard Co. terminals hooked up to an IBM 4341 CPU at Philip Morris headquarters serves the Gambit system, Jones said.

The candidate expresses no delusions concerning her bid for mayor. She welcomes the fact that Koch is being endorsed by both the Democratic and Republican parties and sees it as a way for the Libertarians to gain exposure by being the only evident party to oppose him.

Jones incorporates her computer training into her campaign strategy. "I look at my campaign as being similar to a computer project," she said. "The campaign starts with an idea, searches for the people's needs, is evaluated by the party, its resources are checked, and if it is feasible it will come off. It's like a project. You have an idea, you check user's needs, the DP organization evaluates it, hardware and software resources are checked and then you continue or not, based on a judgment," she said.

Aside from the basic New York political issues addressed by the candidates, Jones has political ideas that can directly affect the computer community. She spoke of Philip Morris' interest in transferring data to European countries and the problems that arise in the attempt.

She said that the Europeans are very strict about what is being done with computers and that causes difficulties. "Less government intervention is what is needed," she stated, referring to a fundamental libertarian principle.

Another concern of hers aired was an incident that occurred on the West Coast where she said programmers working for a film company were forced to join a union because they were considered technicians.

"People should be able to determine who they want to work for and under what circumstances," she said.

She also expressed concern over the rights of programmers who create programs or systems within the confines of a company. The question of whether the creation belongs to the programmer or to the company is a ticklish subject that Jones said is not yet decided in her mind, but definitely needs to be resolved.

New York Systems

As far as New York is concerned, Jones thinks the city's computer systems are grossly inefficient. She cited the fact that city agencies and state agencies utilize different system coding. "Whenever information has to be transferred from agency to agency, conversions have to be run," she said. "The city's computer shops are not run as businesses."

When asked about further computerization in New York, Jones said that she is in full support of the technology and sees it as a means of improving life. However, she noted that the proper city government procedures have to be in place to provide necessary services first, because the computers cannot do it alone.

Emphasizing support for the Libertarian Party's stand on guarding personal freedom, Jones concluded by saying, "Because computers are as important as they are, who knows what restrictions will be imposed?"

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These pointer problems make both hierarchical and network data base models inflexible and difficult to modify. When the requirement to move files and applications among processors and among systems is coupled with the need to maintain the ability to transparently access the data base from any point in the network, the problems become staggering.

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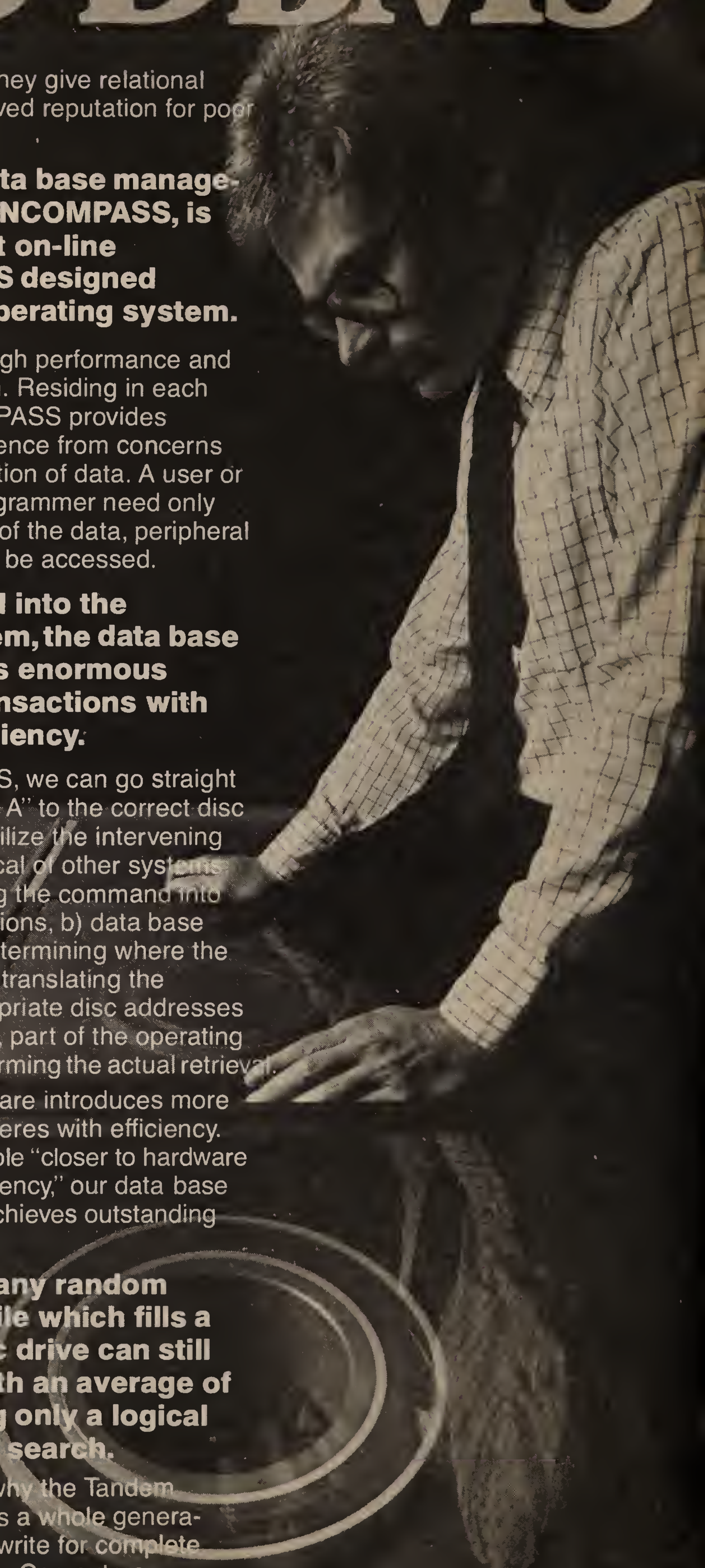

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Stop-Work Order Rescinded

No-Nonsense Plan Rescues Kentucky's MMIS

By Rita Shoor
CW Staff

FRANKFORT, Ky. — It took a no-nonsense approach to outside contractors and 16-hour work days, but Kentucky's Medicaid Management Information System (MMIS) is climbing from the nadir of a federal stop-work order to the zenith of federal certification.

The Health Care Financing Administration (HCFA) stopped federal funds for MMIS development here Dec. 31, 1979, according to Robert Neasham, commissioner of the department for professional support. The decision came after five years and approximately $3.5 million had been spent on a system that did not work to specifications, he said.

Model Project

Ironically enough, the debacle began with Kentucky joining Georgia as part of a "model Medicaid project" for the Department of Social Rehabilitation Services, Neasham said.

Georgia withdrew from the project in 1975. Kentucky proceeded with MMIS development and signed contracts with two consulting firms. Consultech, Inc. of Atlanta was to develop a generalized MMIS model and Louisville, Ky.-based Cybernetics, Inc.'s charter was to "particularize" the model to meet Kentucky's specific requirements, Neasham explained.

Consultech built and delivered the model and Cybernetics attempted to tailor it. However, the system had still not reached production status when the stop-work order came through on the last day of 1979.

Neasham was brought on three months later and his first move was to cancel the contracts with both consulting firms.

He also reviewed five years of MMIS documentation with the General Counsel for the U. S. Department of Human Resources to determine if there were legitimate grounds for bringing suit against either or both firms. The lawyer advised that there was "nothing we could do to recover the funds."

Upon objective examination, it seemed that the state had to share blame with the consulting firms. There were definitely "some things wrong with the contractual arrangements," Neasham stated. For example, both contracts were written on a time and material basis, rather than calling for payment by deliverables. In addition, all development work was conducted off-site and Kentucky agreed to a 30-day acceptance period for testing a software system including some 180 programs. The state was as negligent in developing the contract as were the contractors in obeying it to the letter, Neasham acknowledged. "It was a boondoggle," he said.

However, heeding the federal warning that all states must have a certifiable and operational MMIS by September 1982 or suffer "fiscal penalties," Kentucky is trying for a rapid recovery. We "learn a lot from defeats," Neasham noted.

Adopting a "more cautious, businesslike approach," in-house analysts generated another advance planning document designed to implement the system as it stood. The sum of $560,000 was allocated for contractor's fees and a request for proposal (RFP) drew three responses. All three were priced too high because of "valid considerations," Neasham said.

Kentucky went back to the drawing board and came up with a federally approved work plan calling for the project to be complete by Dec. 31 at a cost of about $2.3 million. The RFP released in March was based on a contract that had several marked differences from the original documents. The new contract required a firm, fixed-price bid, on-site work and payment by deliverables, Neasham explained. It also included a performance bond specifying that if the consulting firm did not perform satisfactorily, it would have to pay liquidated damages.

R. J. Hensen & Associates, formerly a subcontractor and now part of the Professional Health Research organization, was the successful bidder. Work began on May 6 with the first deadline set just one month later. That due date was met and the firm is now in the process of delivering the MMIS pricing component.

The feds are evidently keeping a close eye on things this time around. HCFA reviewer Alex Heslin recently conducted a four-day system overview and "if we miss any deliverables, funding would stop," Neasham said. However, "we believe he [Heslin] is very pleased. . .[and] we're right on schedule," he claimed.

Employees' Pride Restored

FRANKFORT, Ky. — Gov. John Y. Brown's commitment to make Kentucky "run like a company" may be one motivating factor contributing to the state's successful development of a Medicaid Management Information System.

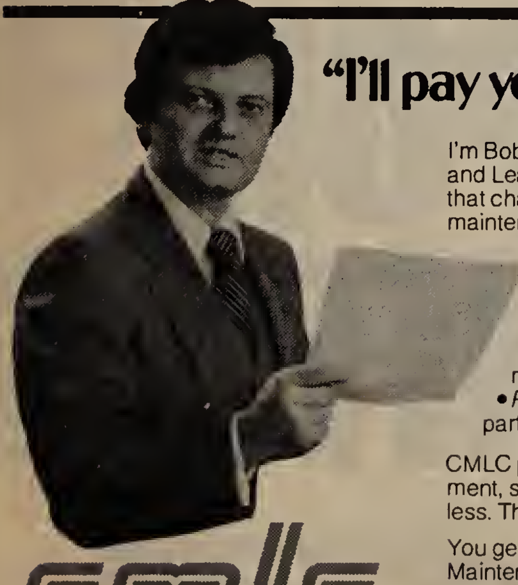
Approximately 34 state employees are involved in the project, according to Robert Neasham, head of Kentucky's central DP organization. Describing the technicians and user/analysts as "some of the highest quality help I've seen," Neasham said they had "no pride in themselves."

That may not be too surprising, considering that the average annual salary for an entry-level programmer/analyst was about $8,000 when Neasham joined the governor's Personnel and Management Cabinet in March 1980. However, things are changing rapidly because of Brown's "Kentucky & Co." concepts.

State employees formerly received a flat 5% salary increase every year and "that was it," Neasham recalled. However, the state is now utilizing performance reviews. Besides incorporating cost-of-living increases, raises are determined by on-the-job performance.

"We want better people working for better pay with more pride in their work," Neasham said. One immediately practical result of the new philosophy is that entry-level programmer/analysts are now moving toward salaries in the $13,000 range.

On a broader level, state employees are encouraged to "think of citizens as customers and shareholders," he continued. Strong fiscal control and project management, simple government forms and emphasis on reducing costs in all areas are also being emphasized.



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Datacomm Briefs

Judge Lets AT&T Use DOD Study

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — "It is clear that AT&T personnel did not draft the study. It is equally clear, however, that they were afforded the opportunity for substantial input . . . Portions of the completed [Department of Defense (DOD)] study bear a strong resemblance to the ideas contributed by AT&T."

So said presiding Judge Harold H. Greene when he decided earlier this month to let AT&T use the DOD study as evidence against the government's antitrust charges. However, Greene said he would give the document less weight than would be accorded "a wholly independent Defense Department study."

The study's major conclusion is that divestiture of AT&T would be harmful to U.S. national security. It also said the Justice Department does not understand how the telephone network operates. According to Greene, the technical portions of the study came almost entirely from AT&T and no effort was made to get a second opinion from the phone company's competitors. While AT&T did not act improperly, Greene said, "the Defense Department employees involved in this matter cannot be exculpated so easily.

Justice Ties Suit To S.898 Changes

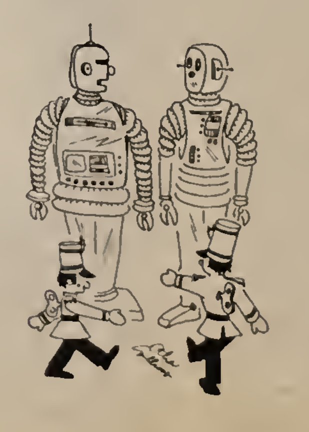
WASHINGTON, D.C. — Another brickbat has been thrown at the Justice Department's plan for ending the great debate over national telecommunications policy.

According to Assistant Attorney General William Baxter, Justice is willing to drop the government's antitrust suit against AT&T if both houses of Congress enact S. 898, the pending rewrite of the Communications Act of 1934, after adding two amendments.

These include one assuring specialized carriers equitable access to the telephone network and the other concerns making Western Electric's equipment sales to Bell operating companies dependent on their share of the local exchange market, as measured by the ratio of Bell local access lines to independent telephone company-supplied access lines.

The latter amendment is intended to provide a "marketplace check on internal Bell system transfer prices," Baxter told the Senate Judiciary Committee recently. However, Datapoint Corp., based on a computer-aided analysis of the amendment, has concluded it will "impose no meaningful limitation upon AT&T."

One reason is that the amendment covers only central office switching/transmission facilities; it excludes terminals, Datapoint said. Also, Western's sales to the operating companies have to be measured for a three-year period; only if the three-year average exceeds the operating companies' local exchange market share can AT&T be accused of violating the restriction.



'Those Are Our Ancestors?'

Ecom Foes Testify To Rate Setters

WASHINGTON, D.C. — The battle over the U.S. Postal Service's (USPS) Electronic Computer-Originated Mail (Ecom) service continued last week in comments some of the combatants submitted to the U.S. Postal Rate Commission.

A key question is whether the commission should reconsider its 1979 decision recommending that the post office offer an electronic mail service. The governors of the postal service accepted that recommendation enthusiastically, but balked at offering Ecom on an experimental basis, as the commission also recommended.

The governors took this part of the decision to court; last May the court ruled that the Postal Rate Commission had exceeded its authority in recommending an experimental Ecom service, but remanded the "entire matter" to the commission.

The meaning of those words is one of the issues in the current proceeding. The Postal Rate Commission said it can legally reconsider the whole justification for Ecom; the Postal Service said it cannot, pointing out that since Ecom's experimental classification was the only question before the court, this is the "entire matter" referred to in the decision.

Communications carriers, commercial suppliers of electronic mail/message services, plus the Department of Justice and National Telecommunications and Information Administration, agree with the Postal Rate Commission.

Their concerns were summarized in a comment submitted to the Postal Rate Commission last week by Satellite Business Systems (SBS). It is questionable "whether Ecom can be properly recommended as a permanent service in light of its presently projected costs ($31.7 million vs. $7.4 million originally) and the potential ability of nongovernment entities to perform the same service as well or better than USPS," SBS said.

The company also suggested that the interconnection restrictions proposed by the postal service may be unfair to specialized carriers.

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'Computer Appreciation' A Must at Michigan College

By Lois Paul
CW Staff

SAULT STE. MARIE, Mich. — "Computer appreciation" courses are being added to the core basic studies curriculum of a small undergraduate school here.

The 2,500 undergraduates at Lake Superior State College currently take 54 hours in basic English, science and languages toward their four-year degrees. Now computer technology will be woven into all the college's academic programs, which include business, engineering, liberal arts and science.

"What I am trying to do is to gather the necessary resources so that every student will be required to take the computer program as part of the general education sequence," Dr. Kenneth Shouldice, president of the college, explained.

Shouldice's growing feeling that his students should become more aware of computer technology was increased this year when the college's baccalaureate nurses graduated without any exposure to this area. "If you know anything about the hospital and medical care setting, I think that is a handicap. That concerns me and I am trying to translate that concern into something," he said.

Lack of Interest

He cited a woeful lack of attention to the impact of computers on the world of work and leisure in the future. The question at Lake Superior is, "How do we, in a responsible way, bring our students into the mainstream?"

The current approach is a gradual one, Shouldice explained, but the commitment is genuine and strong. A special educator, Thomas Boger, will be added to the faculty of the math department this fall to begin work on the curriculum changes.

He will be teaching some computer courses within the mathematics department this year, Shouldice explained, and then next year will be exclusively in the math foundation for a computer technology program.

Boger's task will be to determine the best way to bring computer technology into the general education program. This may eventually require cutting back on some present courses, such as physical education, according to Shouldice.

The computer training would not necessarily prepare students for programming, but instead would give them a general understanding and awareness of the technology and its practical uses.

Formerly a branch of Michigan Technological University, Lake Superior received free IBM equipment a number of years ago in a sort of contest that required an explanation of how the free computer would be used.

This older equipment has been replaced, Shouldice explained, with a Digital Scientific Corp. Meta 4 minicomputer and approximately 24 Intertec Data Systems Corp. Superbrain microcomputers in the library and other locations for student use.

The college has spent about half a million dollars in the last two years for computer equipment and anticipates further purchases. The college presently has programs that provide mathematical orientation and skills in computer technology, train technologists for the repair and manufacture of computers and train students in computer operations.

"The problem, of course, is getting the resources. There is an unfortunate trend in the country for cutting back and containing higher education," Shouldice said.

He also described the unfortunate tendency in education to stay with what is comfortable. "What was done yesterday is comfortable."

'Supercomputer' Project in Works At University of Wisconsin

MADISON, Wis. — The computer science department at the University of Wisconsin here will attempt over the next five years to assemble a "supercomputer" linking the calculating and memory power of 50 to 100 individual computers.

The project, called Software-Partitionable Multicomputer, has been awarded a $4.7 million National Science Foundation grant to buy off-the-shelf systems, link them with coaxial cable and then create the programs allowing them to run together, the university said.

Researchers claimed the system, if it can be assembled, would be a significant breakthrough in forming large networks of linked computers, which distribute processing over as many machines as needed. The project will also test the idea of a multicomputer system that uses special computer programs to recognize a job's requirement for computing resources and then divides or partitions the system to meet the need.

Plans call for the purchase of computers with 512K to 1M bytes of main memory with a one million instruction per second capacity, as well as the purchase of assorted disk drives and equipment.

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Admission to the EM/OC series only (January 14-15) is $245.

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SBA, CDC Team Up for Budding Entrepreneurs

By Lois Paul
CW Staff

BALTIMORE, Md. — Are you about to break out on your own and launch that small business you have been dreaming about for years?

Considering the precariousness of such a move, you might want to enroll in free computer-assisted training courses on managing a small business that are being offered in 45 cities by the Small Business Administration (SBA) in conjunction with Control Data Corp.'s Commercial Credit Co.

All that is necessary to qualify for the training program is a voucher from a local SBA office indicating that you are on the brink of opening a small business. Students in the program use CDC's Plato education system at Commercial Credit Co. centers in cities such as New York, Minneapolis, St. Paul, Minn., St. Louis, Milwaukee, Dallas and Kansas City.

Technical Assistance

A student works at his convenience at the center, with the assistance of a technician who is available to deal with problems, according to James Storr, national marketing programs manager for the Commercial Credit Co.

Training includes "Building Your Own Business," a nine-module course developed with the SBA that covers all aspects of running and managing a small business. Also covered are areas such as accounts receivable and financial management.

An "Introduction to Plato" course is built into the system to guide the first-time user and introductory segments are included in all of the course modules, if the student needs further help.

The SBA developed a pretest screening process that helps determine which modules the student needs to attain the amount of business and management information he is seeking.

CDC became involved with the SBA project through its Commercial Credit Co., which markets products to small businesses. Storr explained that in January 1980 the CDC subsidiary became the first nationwide SBA-guaranteed lender that was not a bank.

"Along this line, we talked about business courses and the need among small businessmen for training. We developed the course 'Building Your Own Business,' which deals with all aspects of running a business and management assistance people at SBA liked what we had to offer," he said.

Pilot Project

The SBA particularly liked nine modules of the course. In 1979 the organization began a pilot project in five cities, using the abridged version of the course to train small businessmen. Based on the success of the pilot, the program since has expanded to a national effort.

Funding has come from the SBA, with the first $100,000 contract awarded to the Commercial Credit Co. in September 1979 and renewals following at six-month intervals that have extended the program to the end of 1981.

Those preparing to open a small business who are interested in the free training can contact their local SBA office to register for the course. The SBA can direct them to the nearest CDC center that is offering the training.

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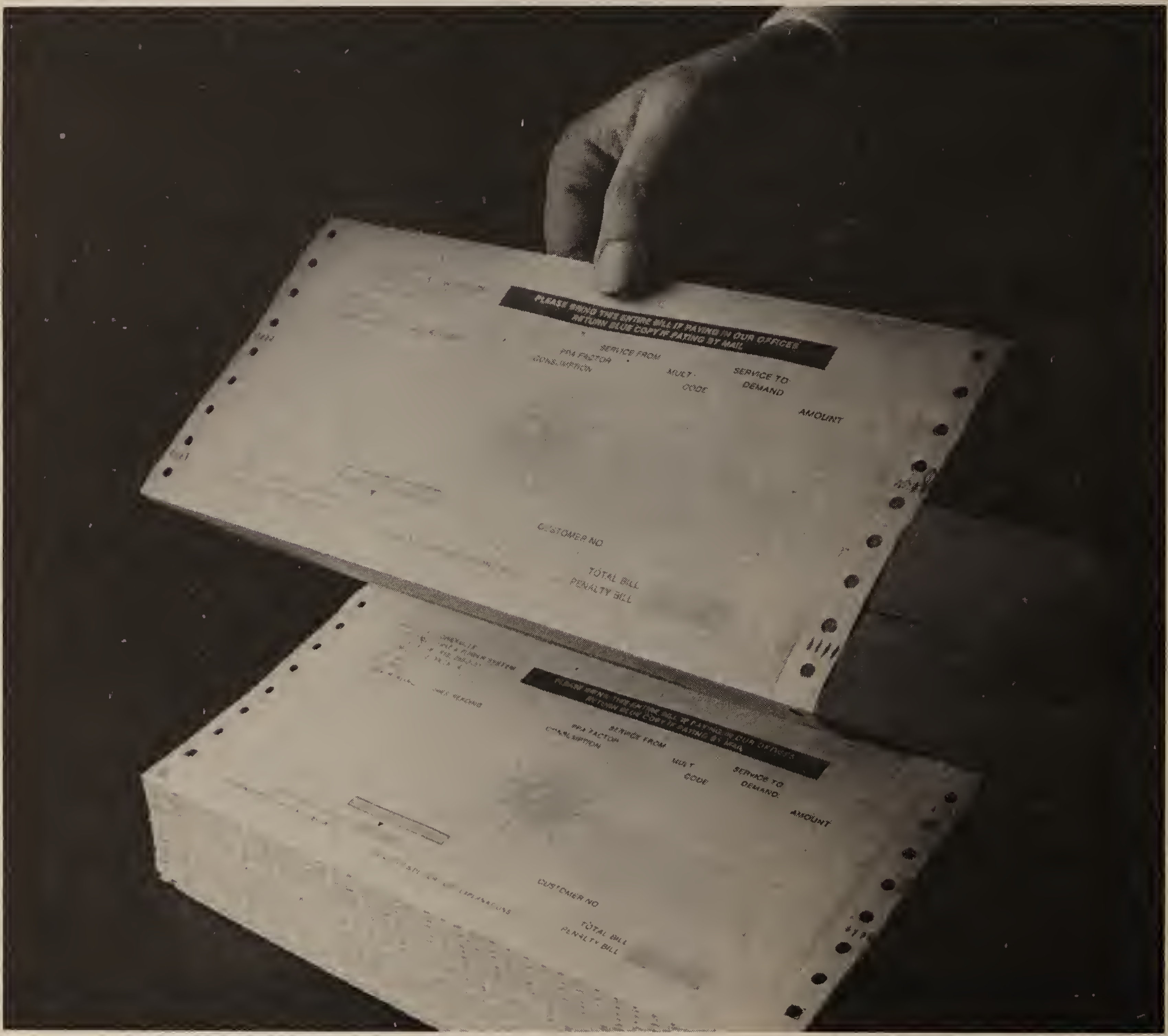

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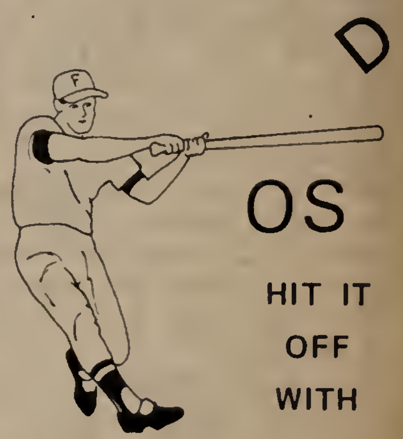

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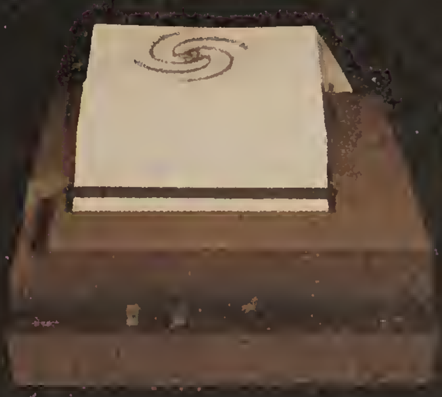

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'Managing Change' Topic Of Federal Conference

WASHINGTON, D.C. — "Managing Change: The Challenge of the '80s" is the theme for this year's Federal Computer Conference, slated to take place here Sept. 21-23.

The annual event, sponsored by Federal Education Programs, features seminars, sessions, workshops and a technology exposition designed to aid federal automatic data processing users.

This is the fourth year of the conference, and the focus will be on the current challenge facing DP professionals with regard to new policy initiatives, technological developments and new constraints on personnel and computer resources, the sponsor said.

Registration information and further details can be obtained from Federal Education Programs, P.O. Box 368, Wayland, Mass. 01778.

Seminars Slated On Automation

BALA-CYNWYD, Pa. — Amy D. Wohl, president of Advanced Officed Concepts, will conduct a series of three-day seminars on "Strategic Planning for Office Automation" beginning in Washington, D.C., Sept. 22-24 and continuing in Los Angeles (Oct. 21-22), Chicago (Nov. 10-12) and New York (Nov. 17-19).

The seminars — intended for office administrators, management information specialists, information systems analysts and educators — will examine such topics as the benefits of office automation; new technologies; planning, priorities and implementation of office automation; and measurement and evaluation of office automation systems.

Registration for each seminar is $695 for the first representative from each organization, and $600 thereafter. Registration forms and additional information can be obtained from Advanced Office Concepts, Suite 433, One Bala-Cynwyd Plaza, Bala-Cynwyd, Pa. 19004.

Seminars Slated On Automation

WELLESLEY, Mass. — Q.E.D. Information Sciences, Inc. released its August 1981 to January 1982 schedule of courses for its EDP Education Program (Edpep), a series of 102 courses to be held at seven regional learning centers throughout the country.

The courses are software- and systems-related and include data base, data communications, systems development, project management, quality assurance, systems and DP management and DP auditing and control.

Q.E.D.'s regional learning centers are located in Wellesley, Mass.; New York; Teaneck, N.J.; Philadelphia; Richmond, Va.; Raleigh, N.C.; and Arlington, Texas. All Q.E.D. courses are available in-house, on company location.

A catalog providing course outlines, schedules, locations and fees is available from Q.E.D. at P.O. Box 181, 180 Linden St., Wellesley, Mass. 02181, (617) 237-5656.

Quality Assurance Institute Formed for Users, Vendors

ORLANDO, Fla. — The Quality Assurance Institute (QAI) has been formed as an independent group to improve quality in the data processing environment.

The group, which currently numbers more than 60 companies, was organized by William E. Perry, author of the book *Effective Methods of EDP Quality*.

Perry, who teaches seminars on DP quality, has worked 15 years in the quality assurance department at Eastman Kodak Co. and has also worked for The Institute of Internal Auditors.

QAI plans to sponsor an annual DP Quality Assurance Conference and a series of educational seminars as requested by its membership.

Local chapters of QAI will be formed by the institute to provide an interchange of ideas on quality practices and it plans to issue manuals and a newsletter recapping quality assurance happenings.

Membership is open to DP venders and users who have quality assurance responsibilities, as well as to those who are interested in improving DP quality and to organizations concerned with DP quality assurance.

Additional information about the institute is available from Quality Assurance Institute, 9222 Bay Point Drive, Orlando, Fla. 32811.

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Datapro Updates EDP Directory

DELRAN, N.J. — Datapro Research Corp. is offering an updated version of its *Directory of EDP Suppliers.* The directory contains profiles of more than 1,000 companies that supply products and services for computer users, planners, designers, vendors and operating staff.

The 214-page directory is designed to help DP management choose vendors by presenting standardized entries describing each company's location, size, management, financial status, product line and sales and service organization, according to the vendor.

It is available for $29 from Datapro at 1805 Underwood Blvd., Delran, N.J. 08075.

Norberg Succeeds Stuewer As Babbage Institute Director

MINNEAPOLIS, Minn. — Dr. Arthur L. Norberg has been appointed director of the Charles Babbage Institute for the History of Information Processing at the University of Minnesota.

Norberg will assume the directorship on Sept. 1, replacing acting Director Dr. Roger Stuewer. Norberg is currently program manager for the National Science Foundation (NSF) Program in Ethics and Values in Science and Technology.

Norberg received his Ph.D. in the history of science from the University of Wisconsin in 1974. Since then, he has taught history and science, worked as research historian at the Bancroft Library, University of California in Berkeley, and been active in many professional societies.

He will hold a tenured appointment as associate professor in the computer science department at the university and will concurrently teach in the history of science and technology program.

The Babbage Institute is a center for study of the history of the technical and socioeconomic aspects of information processing. The institute strives to promote awareness of the impact of information processing on society.

Software Issues Theme of Meet Set for Oct. 5-6

WASHINGTON, D.C. — "Software: Critical Decisions — Issues for the New Era in Computers and Information" will be the theme of the National Conference on Software, sponsored by the Commission on Software Issues in the '80s, to be held here Oct. 5-6.

Daniel D. McCracken, an author and consultant, will keynote the event with a speech entitled "The Importance of Software in the '80s." Other speakers will include Martin A. Goetz, senior vice-president of Applied Data Research, and Rep. George Brown (D-Calif.), a spokesman said.

The Commission on Software Issues in the '80s was established to present critical and objective reports airing the social, economic, technical and legal issues arising from the development and use of computer software during the coming decades.

Additional information on the conference can be obtained from the conference manager at the U.S. Professional Development Institute, 12611 Davan Drive, Silver Spring, Md. 20904.

People Management Focus of Seminar

ATLANTIC CITY, N.J. — A productivity management seminar sponsored by Keane, Inc. is slated to take place here Sept. 30-Oct. 2.

According to seminar sponsors, productivity management is a people management program, as opposed to a product development methodology. Particular attention is placed on the user, the project manager and the personnel aspects of a project, rather than the technical aspects.

Cost of the seminar is $475/person, said Raymond Smith at Keane, 210 Commercial St., Boston, Mass. 02109.

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The FAST-3800 family

The new FAST-3815 is an entry-level version of the Intel FAST-3805 semiconductor disk. Both devices in the FAST-3800 family offer impressive environmental savings. Power costs, cooling costs and space requirements are at least half of those of conventional disks.

Intel's FAST-3815 releases your disks for more productive use, offers increased systems performance, and is available *now.* Interested? Contact Intel's Market Information Office at 512/258-5171. Or mail the attached coupon today.

☐ Send details on the FAST-3815 semiconductor disk.
☐ Have a salesman call immediately.

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Call for Papers

COMPUTER SOCIETY OF INDIA'S EDINFO '82, Madras, India, Jan. 20-22.

The Computer Society of India is seeking papers for its International Symposium on Education Informatics, covering such topics as new instructional techniques, nonformal education, employee and user training, international cooperation and social consequences.

Extended abstracts of 1500 words or less with essential references (three copies) should be submitted by Oct. 15 to Chairman, Program Committee, Prof. D.V.R. Vithal, Director, University Computer Centre, Osmania University, Hyderabad-500 007, India.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS' (IEEE) SOUTHEASTCON '82, Destin, Fla., April 4-7, 1982.

The IEEE's Region 3 technical conference is seeking papers for the purpose of presentation and student competition on new developments in the theory, concepts, techniques and applications of electrical and electronic engineering.

Full abstracts (50 words) and summaries (200 to 500 words) — four copies each — are due by Oct. 1. Short abstracts (100 words) — four copies each — are also due by Oct. 1. Notification of acceptance and mailing of author's kit will be sent by Nov. 15; final manuscripts are due by Dec. 31.

Abstracts and proposals should be sent to Alfred E. Bills, The Analytic Sciences Corp., Suite 1, 24 Hollywood Blvd. W., Fort Walton Beach, Fla. 32548. Additional information can be obtained by contacting Southeastcon '82 Chairman, U. F. Graduate Engineering Center, P.O. Box 1918, Elgin Air Force Base, Fla. 32542.

INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS' (IEEE) REGION 5 1982 CONFERENCE AND EXPOSITION, Colorado Springs, Colo., May 3-7, 1982.

The IEEE's Region 5 technical conference is seeking papers for presentation at the Region 5 Conference on themes related to the "Emerging Technology — A Bridge to the Twenty-First Century." Subjects include: communications and signal processing; electronics in space; energy systems; technical education; biomedical electronics; solid-state circuits and electron dvices; very large-scale integration; computers; instrumentation; military electronics; consumer electronics; transportation systems; and artificial intelligence.

Abstracts (200 words) should be sent by Sept. 15 to the Technical Chairman, Dr. Darrell Vines, Department of Electrical Engineering, U.S. Air Force Academy, Colo. 80840.

SOUTHERN COMPUTER MEASUREMENT GROUP FALL MEETING, Charlotte, N.C., Oct. 1-2.

The Southern Computer Measurement Group is accepting papers for the October meeting.

Details are available from the chairman, Sidney Finehirsh, First National Bank, P.O. Box 4148, MC 2331, Atlanta, Ga. 30302, or from the program director, Marcus Reed, Western Electric, P.O. Box 25000, Greensboro, N.C., 27420.

COMPUTER AIDED MANUFACTURING-INTERNATIONAL, INC., COMPUTER-AIDED QUALITY, Baltimore, Md., May 11-14.

Computer Aided Manufacturing-International, Inc. is seeking papers on the subject of "Computer-Aided Quality" in manufacturing, assembly, inspection, test and quality control functions within the computer industry.

Abstracts may be submitted for review (300 to 400 words) by Oct. 20. A brief abstract (50 words) should accompany the longer one. Final selection will occur during the week of Oct. 27. Acceptance notifications will be sent during the week of Nov. 3. All prospective authors should have company approval to present the paper upon submitting abstracts. Abstracts should be sent to Computer Aided Manufacturing-International, Inc., Attention: Meetings and Expositions, Suite 1107, 611 Ryan Plaza Drive, Arlington, Texas 76011.

Books Discuss Micrographics

WASHINGTON, D.C. — The International Micrographics Congress has released the following four publications:

- *Computer Output Microfilm: Its Library Applications* — a primer on computer output microfilm (COM) that provides an overview to hardware, software and applications of COM in business, science and libraries. Written by Dr. William Saffady, the text is 198 pages, and sells for $12.
- *Productivity and Records Automation* — a guide for making decisions that will affect the productivity of organizations. Written by Dr. Robert J. Kalthoff and Col. Leonard S. Lee, the text is 380 pages and costs $26.
- *Micrographics* — a textbook on micrographics including microforms, source document microfilming, COM, micropublishing, the use of microforms, bibliographic control, storage and retrieval. Written by Dr. William Saffady, the text is 238 pages, and costs $26.
- *The Evaluation of Micropublications* — written from the user's point of view, this is a booklet on micropublishing, microformats, image legibility, preservation of master films, production of hard copies, film types and archival permanence. Written by Allen B. Veaner, 59 pages, $5.

All publications are available from the International Micrographics Congress, Publications Sales, P.O. Box 34146, Washington, D.C. 20034.

AEDS Elects Spuck

WASHINGTON, D.C — Donald W. Spuck, professor and chairman of the Department of Administration and Supervision, University of Houston, has been elected president of the Association for Educational Data Systems (AEDS) for 1981-1982.

AEDS is a professional organization dedicated to the exchange of ideas about the relationship of computer technology to education.

AEDS is located at 1201 16th St., N.W., Washington, D.C. 20036.

Software Booklet Out

WASHINGTON, D.C. — The U.S. Department of Commerce is offering a free booklet on "Software Development Tools: A Reference Guide to a Taxonomy of Tool Features."

The booklet was developed to aid users in evaluating software tools. Subjects covered in the 12-page booklet include features of various levels of software tools, output features and tool classifications.

The booklet is available from Software Tools Project, Room A-265 Technology, National Bureau of Standards, Washington, D.C. 20234.

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Could Things Possibly Be Worse?

Turnaround Time

By Larry E. Long

Q **Should I change careers? I have had seven jobs in the last three years. During this three-year period, I was divorced and experienced financial problems.**

I have a Bachelor of Arts degree in applied mathematics and computer science.

Before the marriage broke up, I worked as a programmer on two jobs lasting one and three years, respectively.

After changing jobs, the marriage dissolved. I stayed with the university for 11 months and have since had the following job record: small companies — two months, three months, two months, eight days, two months; contract systems companies — one month, five months; and one large company for 18 months. My boss of the eight-day job called me a nuisance and asked that I resign or be fired. I was out of work for three months after that.

Well, I'm unemployed, living at home with my parents, broke, divorced and about 30 years old. Everything looks bad for me.

A Although you may consider your situation desperate, it could be a lot worse. You have a college degree in a marketable discipline, youth, mobility and seven years of on-the-job programming experience. You've had success at obtaining employment under similar circumstances and you can do it again.

I'll grant that your employment history is not ideal, but there are a good many computer centers under considerable pressure to produce that would be willing to employ you.

Job hopping is part of the business, but you have overdone it. You need to establish a creditable employment record by working hard at being successful in your next job.

Another option is to take a break from the "real world" and attend graduate school on a full-time basis. After a year and a half to two years, you will have a new perspective and a ticket to reenter the job market without reference to employment history.

Q **I am a DP graduate of a vocational technical school and have just completed a programming internship (following 10 years as a professional musician). I am now seeking a programming position with a small company somehow related to the music industry and located in the San Francisco Bay area.**

A Do you want to be a musician or enter the DP profession? An indirect association with music through the computer center is not likely to render the type of musical association you seek.

You should be more realistic in your search for employment. To restrict your search so drastically is to confine your career opportunities.

Q **I am again assessing my long-term career goals. Please help. After obtaining a bachelor's degree in accounting, I spent two years as an internal auditor and more than four years in manufacturing environments working independently as a user analyst for DP system implementation projects. At the same time, I earned an associate's degree in data processing. Because I felt I did not have enough technical background or experience to become a systems analyst or DP auditor, I took a demotion to work as a Cobol programmer in a government agency for the next two years.**

Recently I was reclassified as a systems analyst, but the economy has threatened my job security. Without a CDP, Cisa or an MBA, where do I go from here? The agency I work for has provided me with little state-of-the-art exposure such as data base. Two years of programming experience is minimal qualifications and six months as a systems analyst is hardly worth mentioning. Do you have some suggestions? There must be a niche for me.

A You've been talking to the wrong people and probably working in the wrong place. The circumstances under which you work have instilled a lack of confidence in your abilities. A well written resume will be well received and prompt your consideration for meaningful positions as an analyst or a DP auditor.

The CDP, Cisa and MBA are three of many items that could be logged in the nice-to-have column, but at present are certainly not considered essential for success.

Long is a professor at Lehigh University, a DP consultant and author.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, *P.O. Box 880, Framingham, Mass. 01701.*

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Calendar

Sept. 17-18, Boston — **Software Project Management.** Contact: Digital Equipment Corp., Educational Services, Seminar Programs, BU/E58, 12 Crosby Drive, Bedford, Mass. 01730.

Sept. 17-18, Toronto — **SAS Basics Course.** Contact: SAS Institute Inc., P.O. Box 8000, Cary, N.C. 27511.

Sept. 20-22, Andover; Mass. — **Word Processing – An Industry in Transition.** Contact: Richard D. Murray, Director of Conferences, Institute for Graphic Communications, Inc., 375 Commonwealth Ave., Boston, Mass. 02115.

Sept. 21, Houston — **Frontiers of Computers in Medicine.** Contact: Robin B. Lake, Biometry, University Hospitals, Cleveland, Ohio 44106.

Sept. 21-22, New York — **Word Processing Implementation Workshop.** Contact: National Institute for Management Research, Department H, NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 21-22, San Francisco — **Computer Law 1981: Acquiring Computer Goods and Services.** Contact: Practising Law Institute, Department TAC, 810 Seventh Ave., New York, N.Y. 10019.

Sept. 21-22, Chicago — **Developing and Implementing Purchase Order Management Systems.** Contact: Sylvia Vogelman, Seminar Manager, Center for Retailing Management, 425 Park Ave., New York, N.Y. 10022.

Sept. 21-22, San Francisco — **Analog MOS Integrated Circuit Design.** Contact: Continuing Education in Engineering, University of California Extension, 2223 Fulton St., Berkeley, Calif. 94720.

Sept. 21-22, Washington, D.C. — **How to Manage Data and Information as a Resource.** Contact: Arnold Barnett, Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 21-23, Itasca, Ill. — **SAS Regression & Anova Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511

Sept. 21-23, New York — **Computer Contracting – A Practical Guide.** Contact: Elaine Formato, ICN, 1331 Palmetto Ave., Winter Park, Fla. 32789.

Sept. 21-23, Washington, D.C. — **Federal Computer Conference.** Contact: Federal Education Programs, P.O. Box 368, Wayland, Mass. 01778.

Sept. 21-23, Chicago — **The Art of Managing Data Processing.** Contact: Nolan, Norton & Co., One Forbes Road, Lexington, Mass. 02173.

Sept. 21-23, Washington, D.C. — **Distributed Data Processing.** Contact:.Charles Fall, Associate Director, ADP Management Training Center, P.O. Box 7230, Washington, D.C. 20044.

Sept. 21-23, Denver — **How to Develop A Long Range DP Plan.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

Sept. 21-23, Washington, D.C. — **Effective Data Base Management.** Contact: Joe Menendez, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 21-24, Piscataway, N.J. — **CICS/VS System Design.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 21-24, New York — **Managing Systems Projects.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 21-24, Mexico City — **International Micrographic Congress.** Contact: IMC, P.O. Box 34146, Washington, D.C. 20034.

Sept. 21-25, Wellesley, Mass. — **Data Analysis/Data Base Design.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 21-25, Philadelphia — **Systems Analysis Workshop.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 21-25, New York — **CICS/VS Command Language.** Contact: Boeing Computer Services Co., 560 Lexington Ave., New York, N.Y. 10022.

Sept. 21-25, New York — **Cobol-Accelerated.** Contact: Boeing Computer Services Co., 560 Lexington Ave., New York, N.Y. 10022.

Sept. 21-25, Pittsburgh, Pa. — **Structured Design and Programming Workshop.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20814.

Sept. 21-25, Washington, D.C. — **Structured Programming and Software Engineering.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Sept. 21-25, Chicago — **Structured**

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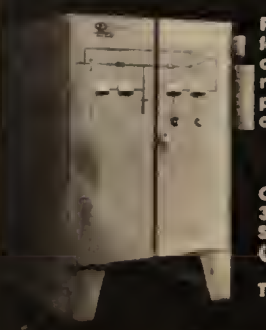

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Calendar

Design Programming Workshop. Contact: Anthony Formica, Yourdon Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 22, Saddlebrook, N.J. — **Principles of Data Communications.** Contact: The Registrar, Cincom Systems, 2300 Montana Ave., Cincinnati, Ohio. 45211.

Sept. 22-24, Chicago — **Data Entry Productivity Seminar.** Contact: Data Entry Digest, 10522 Ridgeway Drive, Santa Ana, Calif. 92705.

Sept. 22-24, Eugene, Ore. — **Second Annual Computer and Office Products Show.** Contact: George Hansen, Eugene Chapter (DPMA), P.O. Box 10063, Eugene, Ore. 97440.

Sept. 23-24, New York — **Word Processing Systems & Management.** Contact: Thomas Wilds Associates, Inc., 516 Fifth Ave., New York, N.Y. 10036.

Sept. 23-25, New York — **Word Processing Supervision Workshop.** Contact: National Institute for Management Research, Department H, NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 23-25, Washington, D.C. — **Technology Revolution: Education and Training.** Contact: Association of Media Producers, Suite 700, 1101 Connecticut Ave., N.W., Washington, D.C. 20036.

Sept. 23-25, Washington, D.C. — **How to Build and Use a Data and Information Resource Directory.** Contact: Arnold Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 23-25, Boston — **Keane's Productivity Management Seminar.** Contact: Raymond Smith, Keane, Inc., 210 Commercial St., Boston, Mass. 02109.

Sept. 23-25, Washington, D.C. — **Systems Acquisition Management Workshop.** Contact: National Institute for Management Research, Department I, NIMR Seminars, P.O. Box 3727, Santa Monica, Calif. 90403.

Sept. 23-25, Philadelphia — **Fifth Annual National Seminar of the Data Processing Librarians/Documentation Managers Association.** Contact: Pat Rizziello, National Chairwoman, c/o McGraw-Hill, Princeton Hightstown Road, Hightstown, N.J. 08520.

Sept. 23-26, Hollywood, Fla. — **Cadre '81.** Contact: Karen Gardner, Applied Data Research, Princeton, N.J. 08540.

Sept. 24, New York — **Working Women – Designs for Workplace Health.** Contact: Women's Occupational Health Resource Center, Columbia University, School of Public Health, 60 Haven Ave., B-1, New York, N.Y. 10032.

Sept. 24-25, Wellesley, Mass. — **Effective Presentations.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 24-25, Vancouver, B.C. — **Systems – the Challenge of the '80s.** Contact: Association for Systems Management, Fifth Floor, 960 Burrard St., Vancouver, B.C. V6Z1Y3.

Sept. 24-25, St. Louis — **Datacon '81.** Contact: John Vaughan, Ralston Purina Co., Checkerboard Square, St. Louis, Mo. 63188.

Sept. 24-25, New York — **Contesting Computer Disputes.** Contact: Law & Business, Inc., Harcourt Brace Jovanovich Publications, 757 Third Ave., New York, N.Y. 10017.

Sept. 24-27, Washington, D.C. — **Second Annual Mid-Atlantic Computer Show & Office Equipment Exposition.** Contact: National Computer Shows, 824 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 25-26, San Francisco — **The Electronic Office: Concepts and Issues.** Contact: Barbara Rufrano, Wiley & Sons, Inc., 605 Third Ave., New York, N.Y. 10158.

Sept. 28-29, Chicago — **SAS Basic Course.** Contact: SAS Institute Inc., P.O. Box 8000, Cary, N.C. 27511.

Sept. 28-29, Milwaukee — **Computer Aided Manufacturing.** Contact: John M. Leaman, Program Director, Department of Engineering & Applied Science, University of Wisconsin-Extension, 929 N. Sixth St., Milwaukee, Wis. 53203.

Sept. 28-30, Washington, D.C. — **Effective Data Systems Development.** Contact: Arnold Barnett, Barnett Data Systems, 19 Orchard Way N., Rockville, Md. 20854.

Sept. 28-30, Chicago — **Development of the Automated Office: A Managerial Perspective.** Contact: Automated Office Systems, Suite 312, 419 Boylston St., Boston, Mass. 02116.

Sept. 28-30, Raleigh, N.C. — **Project Management and Control.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 28-Oct. 1, New York — **DMS/CICS/VS Design and Programming.** Contact: I. Zelin, Comped, 1133 Ave. of the Americas, New York, N.Y. 10036.

Sept. 28-Oct. 2, New York — **Systems Design Workshop.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 28-Oct. 2, Arlington, Texas — **CICS Command Level Programming.** Contact: Priscilla Goudreault, Q.E.D. Information Sciences, Inc., P.O. Box 181, Q.E.D. Plaza, Wellesley, Mass. 02181.

Sept. 28-Oct. 3, Washington, D.C. — **Comparative Data Base Management Systems.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

Sept 29-30, Toronto — **Datapac Users' Conference.** Contact: Kay Hunt, Datapac User Group, 2nd Floor Systems, 2 Bloor St. E., Toronto, Ontario M4W 3H7.

Sept. 29-Oct. 2, Denver — **The North American Datamanager User Group Conference.** Contact: MSP Inc., 21 Worthen Road, Lexington, Mass. 02173.

Sept. 29-Oct. 2, Denver — **Structured Systems Design.** Contact: Jim Highsmith, Ken Orr and Associates, Inc., 715 E. 8th, Topeka, Kan. 66607.

Sept. 30, Sturbridge, Mass. — **Word Processing – Concepts and Management.** Contact: Better Word Technology, P.O. Box 515, Turnpike Station, Shrewsbury, Mass. 01545.

Sept. 30-Oct. 1, Springfield, Ill. — **Microcomputers in Elementary and Secondary Education.** Contact: Kathleen Kelly, Continuing Education, Division of Academic Affairs, Sangamon State University, Springfield, Ill. 62708.

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EDITORIAL

Realistic Expectations?

While the fabric of American society is becoming increasingly dependent on computing, the nation's universities and colleges are losing capacity for training professionals who can apply and extend the technology.

Higher education in computing is collapsing, but professional groups are unrealistic in expecting the federal government to save the day through increased subsidies and tax law revisions meant to entice private sector assistance.

Such federal support is sought by members of the "consensus panel" that recently analyzed higher education in computing for the National Science Foundation. This blue-ribbon panel called on Congress, the federal executive branch and various agencies to make rescue of academic computing a top priority [CW, July 27].

The panel's analysis is a commendable contribution, deserving gratitude from the computing community. But the federal government now is generally more concerned with saving itself than saving computing in universities and colleges.Those clamoring for more federal aid to computing must queue up behind innumerable other groups seeking extra dollars to resolve other perceived crises. There are too many squeaky wheels for the supply of grease.

The Reagan administration's efforts to cut the size of most federal agencies not officially chartered for warfare and espionage threatens federal aid to impoverished citizens.

In the area of education, funds for instruction in reading and writing at the grammar school-level may be reduced along with funds for instruction in core dump reading and compiler writing at the college level.

Fighting for their jobs, congressmen and bureaucrats wonder how to scratch appropriations for existing programs the broad public considers its due. New programs intended to bolster higher education in computing under the aegis of a national information policy can interest few federal legislators and officials right now.

On the other hand, the Reagan administration's efforts to greatly enlarge and "unleash" federal agencies that are chartered for warfare and espionage could result in the programs many people want for improved academic computing. The Defense Department has long been a prime source for grants to academic computer scientists, after all.

Still, Reagan's appeal for more than a trillion dollars with which to fight (or appear ready to fight) the Soviet Union could be seriously undermined by further disintegration of the Soviet bloc, which has seldom seemed less credible as an invader of industrialized democracies — given the Polish dissension, the Afghanistan quagmire and unrest within Soviet borders.

Rather than stake the future of higher education in computing on federal government resources, the computing community should look to the most stable and available source for the needed cash — itself.

DATA PAST

Five Years Ago
Aug. 30, 1976

NASHVILLE, Tenn. — Software programs acquired by a user from an outside source are intangible personal property — regardless of how they are transmitted — and therefore cannot be taxed under the Tennessee Sales and Use Tax Law, according to a decision handed down by the state supreme court here. Judge William Fones ruled "what is created and sold here is information."

Ten Years Ago
Aug. 25, 1971

LJUBLJANA, Yugoslavia — General economic tightness and the remoteness of the site for the 1971 Ifip Congress made their mark on the triennial meeting of the Internation Federation for Information Processing. Many exhibitors decided the relative barrenness of the local market more than counteracts the advantages to be gained from communications with the East.

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LETTERS

DG, DEC Ratings Disputed

In regard to "Superminis: An Alternative" [CW, July 13]:

I realize how difficult it must be to compile that much information, yet I feel there was one serious discrepancy that needs to be noted.

From my understanding, the "Performance Rating" of listed machines is directly related to its rating for millions of instructions per second (Mips). From available industry information, the Mips rating for the Digital Equipment Corp. VAX-11/780 and the Data General Corp. Eclipse MV/8000 were incorrect. Therefore, so were their performance ratings.

A more accurate rating can be found in the Dean Whittier Reynolds' "Random Access Monthly" newsletter for June 1980. This independent analyst's report gives the VAX-11/780 a Mips rating of .9 as opposed to the 1.9 Mips rating shown on your chart. It gives the Eclipse MV/8000 a rating of 1.1 as compared with your rating of 1.4 Mips for the machine.

Computerworld is one of the most widely read computer publications around. I'm sure articles such as your "Hardware Roundup" have considerable influence on people considering the purchase of a new computer system. Perhaps we could see a more detailed performance analysis in a future issue.

John Butler
Manager, Product Planning
And Management
Data General
Westboro, Mass.

IBM's SNA Strategy

I am pleased that your article "Are SNA Users Locked Into An All-IBM Environment" quoted the Communications Solutions report saying, [CW, Aug. 3] ". . . as [Systems Network Architecture (SNA)] has matured, IBM has adopted a strategy of providing network management and application software that spans various components of the network."

Further, it is correct that ". . . IBM intends to continue offering users valuable functions such as distributed access to host data bases and compatible interfaces between various distributed software products."

While the provision of these capabilities does require the functional richness of SNA, it does not require IBM products, since SNA is well-documented and products based on SNA architecture are offered by several vendors. This multivendor implementation of SNA is analogous to the multivendor implementation of System/370 architecture.

The availability of SNA-compatible products from an ever-growing number of vendors is evidence of both the open nature of SNA and its success.

We believe SNA is the most open architecture in the industry, supporting the widest variety of terminals of any vendor. Consequently, a broad selection of product choices is available to the SNA user from IBM and other equipment manufacturers.

Your headline asked "Are SNA Users Locked Into An All-IBM Environment?" The answer is clearly no!

Robert F. Steen, Ph.D.
Director of Architecture
IBM Systems Communication
Division
Research Triangle Park, N.C.

Computerworld welcomes comments from its readers. Preference will be given to typed, double-spaced letters of 150 words or less. Letters should be addressed to Editor, *Computerworld*, P.O. Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

READER COMMENTARY/Lon Taulbee

System Design Needs Operations' Input

Success of a new system depends on how well those who deal with it daily understand it. This is not to say that understanding is the only reason for success, however. Those who use the information generated by a system must be assured that it is up-to-date, complete, correct and received on time. Business decisions that result in failure are always the product of information that is too little, too late and/or erroneous.

By the time a user has accepted a new system, one important factor has usually been forgotten. Next to the user, computer operations has the most influence on continued system success. Yet, operations is the most misused and least informed area of the entire management information systems (MIS) department.

Operations is seldom a deciding factor when a new system is being designed. Traditionally, hardware constraints and user requirements have been the only considerations. Which type of medium to use for input and output has been left to the analyst's discretion. Making decisions based on options invoked by a program, balancing reports and performing a multitude of other tasks that involve important decisions have been delegated to the operators. Because of these factors many good systems have failed.

Does this imply that operators are ignorant and incapable of making proper decisions when needed? Absolutely not. The problem is, when people are not given complete and valid information, they cannot make correct decisions.

There appears to be a growing awareness of the problem in the industry. Through state-of-the-art hardware and application and system software, more functions and decisions are being performed automatically.

Ideas to Consider

This is fine if your department's budget allows you to convert to state-of-the-art facilities. But if your company is like most, the software and hardware used are far from being the latest in technology. Your programs have so many patches in them that even the most experienced programmer "sweats blood" when trying to debug them. If this sounds like your department, here are some ideas to consider when making choices in the design or rewrite of a system.

Documentation: You should assume nothing; if it can be thought of, it should be documented. Documentation should be aimed at the least experienced operator. Leave nothing to the imagination. A training session for operators to cover documentation is extremely helpful.

Decisions by the operator: Do you want the operator making decisions or supplying answers to options requested by a system? Use as many decision and date tables as possible. Remember that an extra routine or two hours of extra coding can save many hours spent in recovery whenever an operator makes a wrong decision. Systems should be as self-sufficient as possible. Where a decision cannot be automated, the options should be documented and explained to the operators.

Choice of tape or disk as a storage medium: Obviously, there are other important factors to weigh in this decision, but one in particular is too often overlooked. Use of tape requires a manual function and any manual intervention will slow down processing. If the tape has not already been retrieved, the operator must go to the library, programmer's desk or somewhere else to look for it. The results are obvious.

Disk is much faster and more reliable, involves virtually no manual

(Continued on Page 30)

HUMAN CONNECTION/Jack Stone

Adventures in Word Processing

Here is the true story of a teenager by the name of Michael Leslie and his adventures with word processing systems in the noble offices of the U.S. federal government. He is a full-time secretary by day and a college student by night. His saga suggests that the DP perspectives held by at least one government manager belong to the Paleocene era.

Q: How did your WP program get under way?

A: Many members of our secretarial staff were very unhappy about preparing letters of response to congressional inquiries (congressionals) using even the most modern electric typewriters.

For one thing, the internal sign-off procedures seemingly permitted everyone and his uncle to comment on the text. Naturally, each reviewer needed a perfectly typed copy of the congressional, which was tough to achieve because no error correction was permitted at the draftcopy level, even by typewriter "lift-off" tape. The net of it was that 10 to 30 retypings per letter were not uncommon.

So several of our divisional executives corralled some budget dollars, requisitioned a WP machine and presto — we were in the WP business, albeit one year later and just in time for a reduction in forces (RIF) announcement, as part of our agency was struck down by the Office of Management and Budget's budget axe.

Q: What was the general training plan for your WP staff?

A: The secretaries and clerk/typists who were not on the RIF list and were scheduled to use WP had no formal training on their use, except for a brief demonstration of the equipment at installation time. The rest of the training had to be accomplished by the staff from the instruction manual.

Fortunately, I have an extensive background in computers, having supported my father on his small business micro for a number of years. Wading through the manual was no particular problem for me. But the others suffered. In fact, not one of them could make heads or tails out of the documentation and were so turned off that they gave up using the machine.

Q: But you were in fine shape for moving right ahead with the WP program?

A: I thought I was, but things turned out very differently from what I expected. My trouble began shortly after installation. I had confronted my new and immediate boss (who was not part of the WP decision-making process) with the idea of my preparing one WP draft copy of a congressional and letting reviewers comment directly on the sheet. Thereafter, I proposed, I could enter the changes into the WP machine and generate a clean copy for other reviewers within minutes.

My boss turned down the idea on a number of counts.

First, while waiting for the machine, I rapidly increased my typing speed and accuracy and he felt that my typing capabilities and productivity would diminish if I converted to WP.

Second, the introduction of WP would cause a major deviation in the agency standard operating procedures for the review of congressionals initiated years ago, and he believed that no machines should get in the way of agency tradition and institutionalization.

Third, he was concerned that I would focus on WP operations and neglect my responsibility for answering department telephones.

Q: So, what's happening with the WP equipment now?

A: Oh, it's sitting in the corner of the department chief's anteroom, gathering dust and cobwebs and slowly rusting away. It seems a shame I'm not permitted to use it, but my boss keeps telling me that my typewriter skills are far more important than WP skills and I shouldn't have any trouble getting a decent secretarial job if the RIF hits me.

But sometimes I wonder — suppose a prospective employer only wants a secretary with WP skills?

READER COMMENTARY/Susan Coleman

Germany, France Prove SNA Waterloo for IBM

With its announcement of X.21 and X.25 support in the U.S., IBM, it appears, has finally succumbed officially to the recommended world standard for communications as promulgated by the Consultative Committee for International Telephone and Telegraph (CCITT).

IBM would probably have succeeded in ignoring CCITT had it not been for the ambivalence with which it is regarded in Europe — particuarly in Germany and France. These countries simply dug in their heels when IBM tried to insist on its Systems Network Architecture (SNA) to the exclusion of X.25.

By virtue of multitudes of installations of IBM and IBM plug-compatible processors and of SNA's relative completeness compared with the CCITT recommendations that are still under study, SNA was, and maybe still is, in a strong position to impose itself as the de facto standard.

With the rise of the supermini, a market area that IBM does not dominate, each with its own communications protocol, the need for an international standard was increased.

Packet networks underline this need because of their special ability to link together machines and terminals from a variety of suppliers. And the manufacturers of packet networks, even in the U.S., incorporated X.21 and X.25 in their communications software and hardware.

To allow its users to participate in what was becoming a very attractive means of connecting geographically dispersed machines, IBM was forced to offer requests for price quotations (RPQ). Through these, IBM users could apply for software and hardware fixes that enabled their SNA-based machines to communicate through X.25-based packet networks with SNA and non-SNA devices.

X.25 Envelope

The fix consisted basically of placing an X.25 envelope around SNA messages to enable the data to go through the network, and then of removing the envelope when it was back in an SNA environment.

But these RPQs were available only to European, Canadian and UK users. Until recently, U.S. users were mostly unaware that IBM allowed such a concession [CW, Nov. 24, 1980].

The decision to legitimize the products that resulted from these RPQs is a significant step indicating that even the industry giant is susceptible to the chip-chip-chipping of its tiny competitors.

Coleman is editor of Australasian Computerworld.

LETTERS

Cobol Conversion

A.J. Domenico, in his letter to the editor [CW, Aug. 10], accused the DP industry of a "lack of understanding of the future cost of conversion." He cited statistics to show that in a major hardware conversion by the Navy about 30% of the cost was attributed to language translation. He then attacked Robert Grauer for not addressing the other 70% in his Reader Commentary ["Program Copes With Cobol-81 Conversion," CW, July 20].

Now, Grauer was talking about a *software* conversion: adapting existing Cobol programs to meet the proposed Cobol-81 standard. Such a project will have costs other than those associated with automatic translation, but it is unreasonable to expect they will be the same types or in the same proportions as those associated with a hardware conversion at six sites. Neither the tasks nor the imperatives are the same.

It seems to me that it is Domenico who suffers from a lack of understanding.

Bob Brown
Information Systems Bureau
Medical Association
of Georgia
Atlanta, Ga.

Costs and Opinions

John Caron's recent letter [CW, Aug. 17] debating Robert Grauer's Reader Commentary [CW, July 20] made some strong points justifying the $500 million conversion estimate for the federal government. He also stated because of the high cost, he was against the Ansi Cobol-81 standard.

The many articles written so far make me wonder what people said back in the 1800s when they announced they were going to build a railroad to the West Coast — it was going to cost a fortune to lay tracks across the mountains. (Apparently no substantial benefit was to be derived from having a coast-to-coast railroad.)

I favor the Ansi Cobol-81 standard. Whatever the conversion cost — and some shops will do it much more inexpensively than others — it is a step towards ultimately reducing costs.

Most money spent today in DP shops is for maintaining existing systems. The fact that most systems are poorly written and not easily maintained — which the Ansi committee seemed to have in mind when they came out with the new standard — has, in the main, been overlooked by the critics.

Perhaps the Ansi committee is sticking its neck out by trying to enforce some standards in the new Cobol that might not otherwise get there if left to individual shops to enforce. Many individual shops don't have time to enforce standards. They are too busy maintaining programs that are difficult to follow and poorly written!

Besides being the originator of the CSA package (designed to enforce standards) mentioned in Grauer's article, I also teach Cobol productivity seminars around the country. Like others, I have a feel for where Cobol programmers are.

Are we to consider them in this great debate? Many of them are now beginning to understand what structured Cobol and coding standards are all about and see the need for them. Admittedly, others still need a push toward better coding standards such as the new standard will begin to provide. I say, bring on Ansi-81 Cobol!

As to the cost, if the government wants to spend $500 million in converting their Cobol programs to Cobol-81, let's all admit that when our government wants to spend money, it can usually find a way to do it. Caron did nicely point out that there are other costs involved in converting to Cobol-81 — acquiring packages, training in their use, testing and the use of computer time. I have to admit he is right about the existence of these costs.

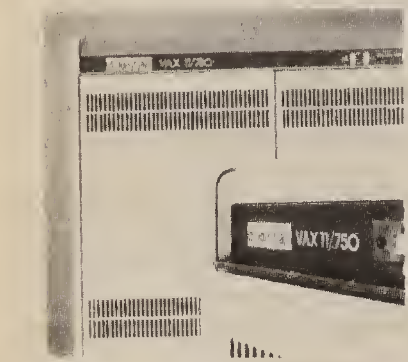
My own thoughts are that they can be kept down. First, a good conversion aid can do much more than Caron would allow for in his article.

Second, if motivation is lacking on the part of manager's, the conversion obviously will take longer and cost more.

Third, if programmers are shown the benefits of Cobol-81, they may convert a lot of programs in little or almost no time at all, when other modifications to a program are being done.

Could it be that a better standard will aid maintenance so much that managers will no longer have grave problems to face and want the old Cobol to protect their jobs? I for one, after listening to the arguments have to wonder!

Marshal A. Crawford
El Paso, Texas



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READER COMMENTARY/Michele Landon

The Importance of Being 'User-Friendly'

We have all heard the term "user-friendly," usually applied to a new software package or screen layout. But what is really needed in the DP industry is a user-friendly atmosphere.

Most of us tend to note the users' lack of DP skills and feel both a little hostile and a little superior. We do not recognize or acknowledge their skills in other fields, many of which are as demanding and technical as our own. As we learn the basics of their business, we believe we know both their field and our own. This is a fallacy. In actuality, the users probably know as much or as little about DP as we know about their areas.

DP professionals feel a false sense of superiority. How does the user perceive this situation?

Many users see DPers as narrow-minded, skilled technicians, interested in bits and bytes, but nothing else. They believe the DP person is incapable of understanding the broad picture or the full business implications.

This atmosphere is conducive neither to good business nor good systems. Systems take longer to design and write, with many iterations and misunderstandings. Often the results are off the mark. Some systems are never used, while others are rewritten or "enhanced" until they are finally usable. Users often accept the systems and use them, but they have to supplement them with manual procedures.

We need a new understanding between DP and user groups. We are all intelligent, dedicated professionals, skilled in our own chosen areas.

I believe the burden of bridging the gap lies with the DP industry. There are two major reasons for our responsibility. First, we built the barrier between the users and ourselves. We did not really attempt to explain the basics of DP to them. We wanted to be a mysterious, super-intelligent group, and we built a mystique about DP that kept others from trying to understand. Further, we prided ourselves on being technicians, unconcerned with the business world.

Second, we are, though it is not often emphasized, a service industry. A company or department has a need for an automated system and we provide the technical skills to create the system. As a further service, we run the system, maintain it and enhance it. As for all services, payment is involved. The user group pays the DP group either directly through service contracts of charge-back systems or indirectly by contributing their share to the DP department overhead. In either case, users do pay and do deserve service that is productive, cooperative and user-friendly.

Landon is a consultant to the Hartford Insurance Group in Hartford, Conn.

LETTERS

Cobol-81 Conversion

There is no doubt there are legitimate costs associated with the conversion to Cobol-81. Nevertheless, the $500 million estimate for the federal government will buy the services of 1,000 "superprogrammers,", at $50,000 per year, for the next 10 years!

Just how much is $500 million? It is almost 40% more than the combined

(Continued on Page 30)

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System Design Needs Operations' Input

(Continued from Page 27)

intervention and usually has a current image copy for recovery purposes. Tape, however, usually has no backup.

Cards as a storage medium: All unit record machines are extremely slow. Storage of cards and required space is also a problem. Again, their handling requires manual intervention. If you have a choice, stay away from cards.

Output reporting: There are three basic media to choose from: paper, computer output microfilm (COM) and on-line reporting. Paper is very expensive, requires manual intervention and is the slowest of the three to process. COM is the least expensive, very fast to produce with new technology, storage is not a problem and it is clean and easy to use. On-line reporting is very expensive, but it requires no manual intervention; thus, it is the fastest reporting method and eliminates the "lost report sickness" that plagues us all.

Program communication through the operator console: This is definitely taboo. Under some of the more sophisticated operating systems, there are too many system functions to observe without the clutter of program-generated messages. They are too easily missed by the operator.

From these items, you can begin to see that the less manual intervention you require of the operator, the faster and more accurate your system will be. Just like anyone else, operators do not like to make mistakes and are embarrassed when they do.

Another area that is crucial to the success of a system is training. Establish a training program for operations. During the system design phase, but before testing and implementation, hold training sessions for the operators. A general overview of what the system does and how it is used in the overall corporate picture is very helpful. As with any production-type work, if the employee understands the importance of his function and how it fits in with the complete picture, he is more inclined to take care of what is being done. The operator is also better equipped to handle unusual problems when they do occur.

While the system is in the design phase, it is beneficial to include operations. Allow operators to have a say as to when and how the system is to be run. They have the best knowledge of what the existing work load is like, such as tape, printer and system utilization. Take time to know your operations staff. They have good and practical knowledge about your data center that can be of great help to you. Improved communication between the two groups can only serve to strengthen the MIS department. The more frequently MIS succeeds the better we look in the eyes of corporate management.

Taulbee is computer operations supervisor for National Steel and Shipbuilding Co. in San Diego, Calif.

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LETTERS

(Continued from Page 29)

1980 revenue of the 15 largest software suppliers. The list includes: Management Systems America, Cincom Systems, Inc., Pansophic Systems, Inc., Policy Management Systems, Inc., ADR International Corp., American Management Systems, Inc., Software AG of North America, Computer Associates, Inc., Florida Software, Inc., Cullinane Corp., Software International Corp., McCormack & Dodge Corp.; Information Science, Inc., Insurance Systems of America, Inc. and Rand Corp. (Please note the companies mentioned derived the vast majority of their revenue from software sales; my apologies to anyone inadvertently omitted.)

Mr. Caron, will it really cost that much?

Robert T. Grauer
University of Miami
Coral Springs, Fla.

Standards Manuals

In response to Harvey Weiss's letter [CW, July 27] concerning DPers and manuals, not liking standards manuals is not the basic problem. The problem lies with whether or not management supports standards development, usage and maintenance. And the support must involve a commitment, both in time and personnel, not merely verbal support.

M.A. Ritlaw's article was not intended to review the psychology of putting the manual into use, but merely its preparation, organization and usage. Besides, a good deal of whether or not the manual will be liked is based on the approach taken in preparing it. That is what the article is trying to get across.

It is apparent that in many DP shops, sufficient emphasis has not been placed on standards manuals. Therefore, any manuals currently in existence may not be liked because they are poorly written. Maybe if current standards manuals were reviewed and revised with some good editing points in mind, we would find them more usable and less disliked.

Ruth Chase
Pennwalt Corp.
Rochester, N.Y.

LETTERS

Educating Employees

The article "Firm Offering Free IBM CICS Courses in Effort to Recruit Skilled Programmers" [CW, Aug. 10] regarding the 16-week course offered by a recruiting firm clearly shows the effect of our industry's short-sighted policies in the area of data processing education. The recruiting firm will train the employees in a skill they are willing and able to learn and then use that education to help influence new companies to hire them.

Those companies who fail to educate their existing employees in new skill areas will find that they no longer have the employees to educate.

A simplified, but straightforward economic model of the situation is easily constructed:

- Firm A has need for skill in CICS.
- Firm A has employee X employed writing Cobol.
- Firm B's employee Y, a Cobol programmer, takes the free course.
- Firm A recruits employee Y to write CICS.
- Firm A's employee X, discouraged, takes the free course.
- Firm B recruits employee X to write CICS.
- The recruiting firm collects substantial fees from firms A and B.

How much simpler for firm A to upgrade X's skills and for firm B to upgrade Y's skills, for a smaller amount of money out-of-pocket and a substantial savings in what would have been the cost of turnover.

William R. Patterson
Somerdale, N.J.

More on Foreign DPers

The letter from Dave Johnson [CW, Aug. 10] left me wondering whether we are working in the same industry. I don't see how anyone can argue that the importing of foreign DPers will have a major depressing effect on salaries. I don't know about Johnson, but I work in the most dynamic, upwardly-mobile industry the world has ever seen!

Every company I know of is crying for more computer scientists. Most studies show the U.S. will need at least one million more DPers than we can produce ourselves by 1990. Due to this pressing demand, an importation of 100,000 DPers over 10 years would have only minimal impact on salaries. Even this level of immigration is unlikely to occur since most countries have the same problem -— a shortage of DPers. (England's problems are due more to their confiscatory tax rates than anything else.) Higher salaries are likely to further exacerbate this shortage by reducing the number of teachers.

Granted, during the last few years the number of foreign DPers has increased. However, during this same period of time, salaries have kept rising faster and faster. More foreign DPers does not necessarily mean less money for American DPers. As long as demand for quality computer scientists continues at its present high pace (for the next 20 years in all probability), we have nothing to fear from foreign DPers. In fact, a large proportion of these foreign DPers will become naturalized American citizens. No matter how you look at it, these people are a net gain for the U.S. and a net loss for their country of origin.

In this industry, even the most incompetent worker is virtually assured a job because of the pressing demand. The competent worker can move up the ladder easily. The aggressive, high-quality worker can move up fast. Anyone who approves of "protecting" American jobs for Americans in this industry is either very unsure of his own ability or bigoted. Frankly, I don't care whether the importation of foreign DPers will help the U.S. or not (although I believe it will). Any attempt to "protect" jobs will simply result in making it harder for Americans to switch jobs.

In the six months since I graduated from college (with only a B.S. in C.S.), I have moved from the low man on the totem pole into the position of a leading designer of the user's language for a new data base system. I know no one can take my job away from me because I am good at what I do. My salary will increase because I will become better at what I do (with a little help from the high demand). I do not need protection

(Continued on Page 32)

BIMSPOOL DOS/VS(E) Terminal Printer Spooling

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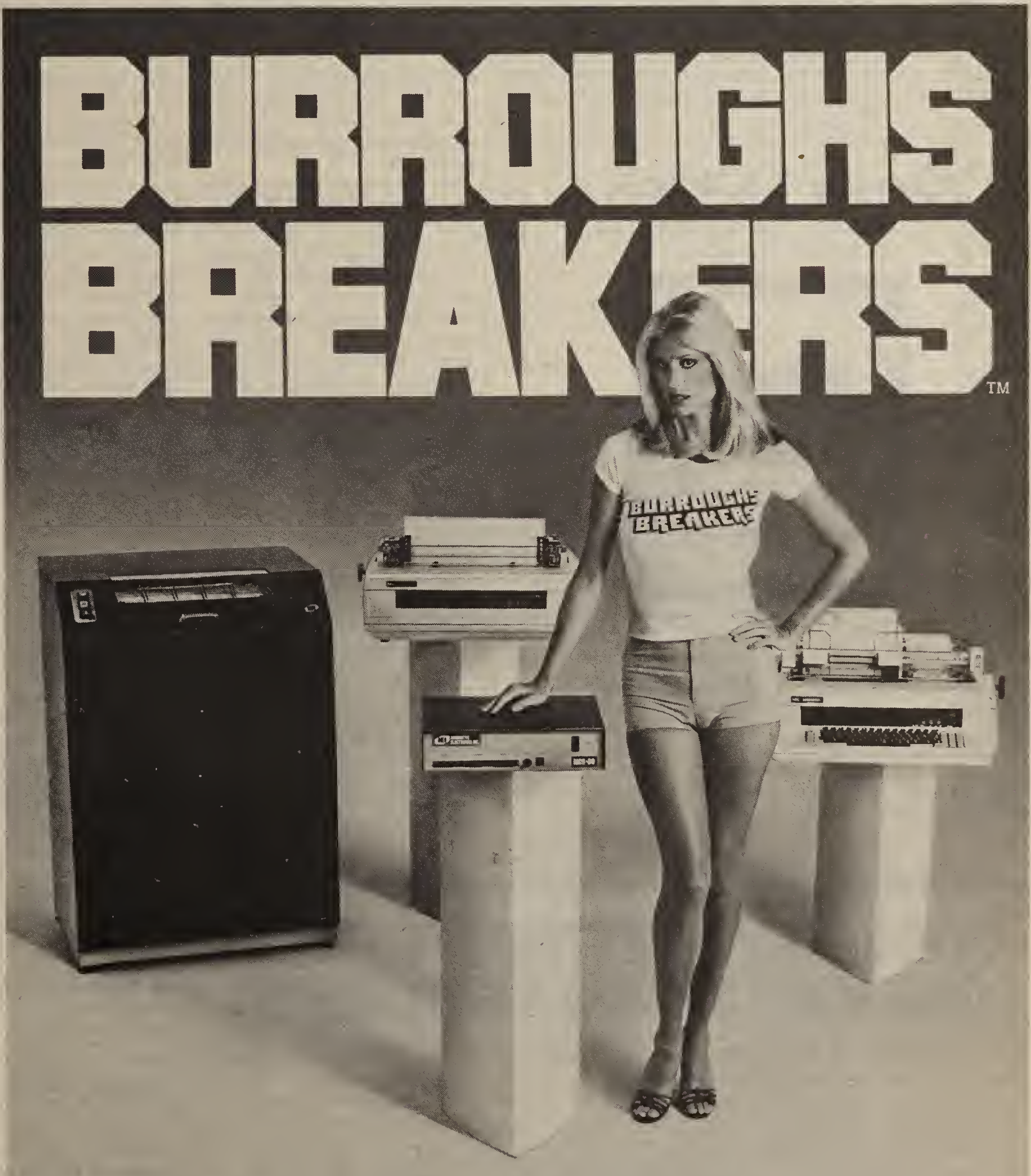

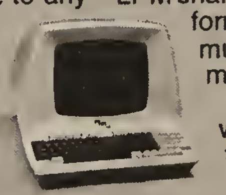

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LETTERS

(Continued from Page 31)

from foreign workers, I need protection from the people who would reduce or halt the competition that made my job possible. If Johnson is afraid of competition, I suggest he join a nice, cozy union in some other industry and leave data processing to those of us willing to work without dubious "protection."

Scott L. Eudaley
Torrance, Calif.

Not Academia's Fault

Your article "Academia Fails Test for DP Jobs" [CW, Aug. 17] made the DP managers interviewed look like a bunch of real cementheads.

Why do these people blame computer scientists for wanting to be computer scientists instead of data processors? Would you hire an electrical engineer to rewire your house, or a mathematician to do your taxes? Well, I wouldn't.

Legend has it that back in the '50s, before the invention of high-level DP languages, you had to be a computer scientist to program an open receivables report or a profit and loss statement. That was a long time ago.

So why don't they let the computer science people work on their bits and bytes (somebody has to) and hire liberal arts or business graduates (available anywhere at .10 cents a dozen) to do the applications programming? That way, they might even pick up someone who has a little interest in the applications he's supposed to be programming. A lot of non-computer scientists know how to program or wouldn't mind learning. None of the applications programmers I know have a computer science degree and most of us are pretty good at what we do.

Welcome to the 20th century.

Paul Krueger
Madison, Wis.

Test for What?

After reading the article "Academia Fails Test for DP Jobs" [CW, Aug. 17], I felt that I had to offer a rebuttal.

Let's step back and look at the problem. The DP department is in existence for one reason: to gather and disseminate information to support the firm for whom they work. The needs of that firm are forever changing, ergo the requirements of the DP department software are ever changing.

We can buy software off the shelf, but it must be modified to fit our particular needs, which are changing. Being that these packages are at present rather rigid, we must hire a staff of programmers to modify them and make additions. The programmers represent a "middle man" between the analysts and getting results. If the package was sufficiently flexible, it could be tailored to fit our applications by the analyst directly, thereby eliminating the staff of programmers.

In the excellent universities, computer science departments are set up much like a physics department in that there are two directions one can take: applied science (engineering) and theoretical science. Both are essential — applied to get things done and theoretical to further the basic knowledge base. Since the theoretical people do things which span all industries and then some, we will remove them from further discussion.

This leaves the applied people. These people are trained in much the same way as the theoretical people, but without so much advanced theory. In short, they are trained as engineers; they are trained in compiler writing, lisp and artificial intelligence — just the stuff that is needed to create the shelf user tailorable packages.

So the problem lies not in the fact that computer science departments do not properly train people as entry-level programmers, but rather in the expectations of the recruiting people as to what type of jobs these people should be doing.

Just as you don't hire a computer engineer to maintain your equipment, you don't hire a software engineer to maintain your software — you hire a technician. Technicians are trained in-house or at trade schools. Engineers are trained at universities, specifically computer science departments. It is not surprising trade schools outdo universities at training entry-level programmers, since that is their purpose.

Randy Lee
Suby, Von Haden
& Associates, S.C.
Madison, Wis.

Source of Talent

I am a regular subscriber to *Computerworld.* I was particularly interested in an article by Bob Johnson entitled "Data Processing Finding Place in NYC Schools" [CW, July 1]. As an employer of computer programmers, I found this article very helpful in pointing to a source of talent that I might otherwise have overlooked.

Please convey my congratulations to Bob Johnson for an excellent piece of reporting.

I.S. Kelson
President
Northeast Consulting
Group, Inc.
New York, N.Y.

Kudos to Zientara

The series "The History of Computing" by Marguerite Zientara is simply sensational. The style is crisp, communicative and extremely readable. The subject matter is well researched. The flow is quite smooth and there is a great deal of cohesion between the components of each article. Such flow and cohesion are difficult to accomplish even for professional writers. I am positive that I reflect the opinions of thousands of *Computerworld* readers.

I hope to enjoy many more articles by Zientara in the future. May I suggest (if it is not already in the works) that the entire series be published in the form of a book.

V. Venkatakrishnan
W. Willington, Conn.

Book Should Follow

I follow with interest "The History of Computing" and I hope you will publish the series all together in one book.

If this is your intention, please let me know how to obtain a copy.

S. Mosimann
Area Systems Manager
Alcan Aluminium
(Europe) S.A.
Geneva, Switzerland

. . . And More

Your series, "The History of Computing," is excellent. What is the possibility of having the entire series compiled and printed in one volume and made available to *Computerworld* readers for a nominal charge? I feel you would have no problems selling this proposed volume. I also enjoy your paper in general, especially the editorial section.

Dale L. Knight
Programming Manager
Truly Nolen Pest Control
Tucson, Ariz.

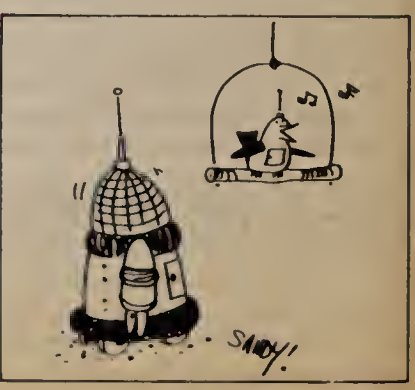
Strange Error?

The series on "The History of Computing" has been the most enjoyable and readable set of articles that *Computerworld* has done. However, a strange error crept into the very end of the biography of Claude Shannon [CW, Aug. 10].

Nobody needs a computer to figure out "how to color a map with four colors so that no contiguous countries have the same hue." A few minutes of doodling will demonstrate that four colors seem to be perfectly adequate, whatever bizarre configurations are contrived for boundaries between countries.

The hard part is to prove that *only* four colors are ever required for a two-dimensional map. It is trivial to produce examples in which four colors are sufficient.

Jim Craig
Software Engineering
Department
Intel Corp.
Austin, Texas



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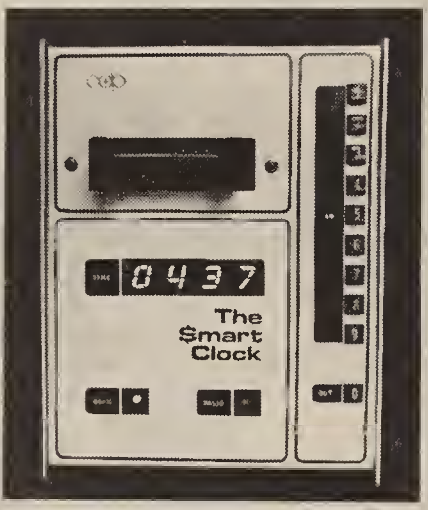

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Scheduling Tightened

Philip Morris Calls for Job Control

Norman Aigner checks the status of a job network through Philip Morris' automated production control system.

By Lois Paul
CW Staff

RICHMOND, Va. — A cigarette manufacturer's DP shop here improved the scheduling and controlling of its daily work load of 1,200 production jobs and 700 test jobs by taking these functions out of human hands.

Philip Morris, Inc. installed a production management package in January and, in the subsequent seven months, has set up implementation standards and converted all its jobs to the new system.

Norman Aigner, day shift data center manager, said the company can control the work load much better now. "Before, you were dependent on people submitting jobs and there was really no schedule, because if they took a break or went out to lunch there was no job running at that time."

The software has enabled the restructuring of job streams and the consequent reduction of runtimes, Aigner reported. The staff has seen as much as four hours cut from the elapsed runtimes of some jobs, he added, helping the DP shop meet daily 8:30 a.m. deadlines for reports.

Mainframe Shop

The company has a large DP shop with 450 employees in operations, system design and development and computer technology.

It uses two IBM 3033 mainframes with 8M bytes of memory each, which soon will be upgraded to 16M bytes; 72 banks of IBM 3350 disks; 24 IBM tape drives; a Storage Technology Corp. drum; two IBM 3800 printers; an IBM 3211 printer and an IBM 1403 printer.

Philip Morris has a mostly Cobol shop that is about 50% on-line and is moving further in that direction, according to Aigner.

His department supports the company's manufacturing, engineering and finance departments, its New York office and a plant in Louisville, Ky., he explained.

All of the jobs run by the DP shop formerly required setup and submission. "That was a big problem for us because there were times with the old scheduling system that someone would forget to run a job and we wouldn't know until a user called us that he didn't get his report," Aigner recalled.

He began looking at production management packages, including Value Computing Co.'s Value; IBM's Operations Planning and Control (OPC) and University Computing Co.'s UCC Seven.

(Continued on Page 34)

Version 1.2 of Relational DBMS Adds Report Writer for VAX-11

BERKELEY, Calif. — Relational Technology, Inc. (RTI) released Version 1.2 of its Interactive Graphics and Retrieval System (Ingres), a relational data base management system for Digital Equipment Corp. VAX/VMS computers. Version 1.2 includes the Ingres Report Writer, performance enhancements and improved user documentation, according to RTI.

The Report Writer is said to enable users to create highly formatted listings of data from an Ingres data base. It also can be used to produce camera-ready output for inclusion in other documents, regular listings of data for management and production needs and ad hoc management reports, the vendor said.

Ingres Version 1.2 reportedly uses VAX shared and virtual memory management features to improve performance.

New manuals have been released for the Ingres Report Writer and the Embedded Query Language (Equel) for Pascal. Major revisions have been made to the "Installations and Operations Guide" and the "Equel/Fortran User's Guide," according to RTI.

Ingres Version 1.2 is being distributed at no additional cost to current users of RTI's Ingres. Its license price is $30,000, with discounts for government, educational and multiple sites, RTI said from Suite 515, 2855 Telegraph Ave., Berkeley, Calif. 94705.

Includes New Commands

ADR Updates Its 'Dataquery'

PRINCETON, N.J. — Applied Data Research, Inc. (ADR) announced a new release of its Dataquery facility for IBM systems operating under OS and DOS. Release 2.2 of the query facility to ADR's Datacom/DB data base management system reportedly includes two new commands, two new user exit points and changes to the command syntax.

Major modifications to the record selection logic will provide the flexibility necessary to qualify and retrieve all combinations of one or more record types from the data base, the vendor said.

Dataquery also will be able to function with Datacom/D-Net, ADR's distributed network manager, which is scheduled for delivery in early 1982, according to ADR.

The vendor claimed that the combination of D-Net and Release 2.2 of Dataquery will enable users to obtain data from anywhere within the distributed network without the requirement for a local Datadictionary.

The permanent license price of Dataquery, which is sold as an option to Datacom/DB, is $11,600 for OS and $9,900 for DOS versions. Monthly, three- and five-year leases also are available, the vendor said.

ADR is located at Rt. 206 & Orchard Road, CN-8, Princeton, N.J. 08540.

'Syncsort' Release Cuts CPU Time

ENGLEWOOD CLIFFS, N.J. — Syncsort, Inc. announced Release 2.4 of Syncsort OS, its sort/merge program for IBM OS/VS environments. Using a new sort/merge technique called Dynamic Merge, the vendor claimed Release 2.4 reduces system resources of CPU time by 30% to 60% and execute control program counts by 35% to 70% over previous Syncsort releases.

Dynamic Merge is an internal technique by which the traditional phases 1, 2 and 3 of a sort sometimes are condensed into two phases, which enables the final output phase to begin while sorting still is underway, the vendor explained.

Release 2.4 includes an extension of the Sum feature, which reportedly provides a way to delete all equally keyed records

(Continued on Page 34)

System 2000 DBMS Now Runs on 4300s Under VM/CMS

AUSTIN, Texas — Intel Corp. announced a version of its System 2000/80 data base management system (DBMS) for IBM 4300 and plug-compatible mainframes running under the VM/CMS operating system. Release 10 includes such features as enhanced recovery, direct access keys, CMS multiuser and multithread support.

Automatic recovery of damaged data bases is designed to ensure a high degree of data availability and integrity. Direct access keys reportedly enable users to accelerate the record location process.

The CMS multiuser feature is said to enable users with relatively small computers to support a number of users concurrently, updating and retrieving data bases in an on-line environment. Multithread reportedly provides additional performance for high transaction rate environments.

The 4300 version of the VM/CMS package is designed to operate on IBM's 4341 Group 1 (or equivalent) and smaller systems. The vendor said it has the functions of the large-mainframe VM/CMS system, except that the multiuser version supports a maximum of eight concurrent users.

Pricing for the 4300 VM/CMS version of System 2000/80 is set at $49,500 for the basic package, with add-on features priced separately. Multithread capability is priced at $20,000, the report writer at $15,000, Intel's Extended Data Dictionary at $10,000 and additional programming language extensions (in Cobol, PL/I, Fortran and Assembler) at $9,000 each.

Maintenance is approximately 10% of the purchase price each year after the first year, Intel said from 12675 Research Blvd., Austin, Texas 78766.

Program Generator Enhances Tandem's Encompass DBMS

CUPERTINO, Calif. — A program generator enhancement to its Encompass distributed data base management system was announced here by Tandem Computers, Inc.

Designated Enable, the program generator can generate programs capable of retrieving and updating. records from a single file with a few lines of data definition, according to a vendor spokesman.

The vendor claimed that Enable can reduce the time necessary to perform on-line transaction processing program design, implementation and maintenance tasks for Tandem's Nonstop and Nonstop II multiple processor systems.

Custom Programs

Using entries in the data dictionary, Enable is said to generate a program that may be customized to meet the particular customer requirements.

In the application implementation process, Enable can write certain parts of the application programs that, once generated, are capable of data additions, updates and deletions, the vendor said.

The Enable package also is designed to generate a sample or prototype model of a proposed application so users can check the fulfillment of design requirements in the early stages of application development, according to the vendor.

Available immediately, the Enable enhancement will have a one-time $5,500 license fee, plus a $1,500 per processor microcode license fee for Nonstop II systems. The license fee for the entire Encompass software package, including Enable, is $26,500, a Tandem spokesman said.

Tandem Computers is located at 19333 Vallco Parkway, Cupertino, Calif. 95014.

'Easytrieve' IPF Generates Programs, Outputs Reports

OAK BROOK, Ill. — Pansophic Systems, Inc. introduced the Interactive Prompting Facility (IPF), an online interactive facility for Easytrieve users operating in the IBM Interactive Computer Control Facility (ICCF).

The features of Release 1.0 of IPF include a question/answer terminal session for generating an Easytrieve program and subsequent report output.

The IPF reportedly asks a series of questions relating to the library (field definitions), selection criteria, sort and control specifications, summary report indications, titles and list fields.

Each response is validated for correct syntax, with descriptive diagnostic messages presented when an invalid response is entered, the vendor said.

Once created, the report program may be saved on a standard operating system data set, checked on-line for correct Easytrieve syntax, or run on-line with the report output routed to the user's terminal, according to Pansophic.

The user may request help with any question the prompter asks by entering the keyword "HELP," which displays the Help text and repeats the question. The ICCF/IPF reportedly is a line-by-line prompter.

IPF documentation consists of a user manual that describes available functions and Easytrieve syntax rules. Existing Easytrieve customers may purchase the ICCF/IPF option for $2,500 for 60 days following the Aug. 1 release date. It is priced at $4,000 for new customers.

The vendor is headquartered at 709 Enterprise Drive, Oak Brook, Ill. 60521.

Philip Morris Gets Job Control

(Continued from Page 33)

UCC Seven got points for including both automatic scheduling and forecasting in one package, Aigner explained, noting that Value required purchase of separate components.

"I had attended some sessions on OPC and when they asked if anybody had any problems, everybody raised their hand," he said, citing concern about this product.

The final push in UCC's direction was satisfactory experience with other products from this vendor, he said. "This is just a superior package," Aigner said. "I had a chance to study a checklist of things we had looked for in a system and this happened to meet more of those than anything else."

When UCC Seven was installed, jobs were first installed on the third shift because it could be controlled more easily than the other two. The few jobs that absolutely required manual intervention were moved off third shift and onto first or second.

The shift now runs by itself, according to Aigner, and manpower requirements have been reduced. The production control personnel now have as their prime function the resolution of any problems that may arise.

The software enables the company to plan what is going to be run and also determines, at the end of each shift, that everything that was scheduled did run, Aigner said.

Production work load management also has given Philip Morris a forecast facility that enables Aigner's department to determine the tapes required for a particular shift so they can be pulled in advance.

"Before we had this ability, if a tape had been removed from the library, there would inevitably be a delay," Aigner said. "Now, since we can prestage tapes, we know in advance if the tape is in our library and we don't waste time waiting."

CPU Time Reduced

(Continued from Page 33)

without performing any summation.

Other enhancements included in Release 2.4 are said to take advantage of nonrandom input files.

The result of a two-year research and development effort, Release 2.4 of Syncsort OS is licensed at $6,200 for three years from the vendor at 560 Sylvan Ave., Englewood Cliffs, N.J. 07632.

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Utility for IMS Users

'FMTGEN' Provides Support for IBM 3270

NEW YORK — A menu-driven format definition utility, which reportedly enables users of IBM IMS data base/data communications environments to develop working Message Format Service (MFS) formats on-line, was announced here by PFK Systems, Inc.

FMTGEN is said to provide comprehensive support for IBM 3270 display and print devices and logical units designed to operate with MFS.

Support for the color, highlighting and graphics facilities available with IMS Release 1.1.6 also is available with FMTGEN, according to PFK Systems.

The utility is available in batch and interactive versions. The interactive version runs as an IMS/DC application on any system including IBM 3270-compatible devices, the vendor said.

Both packages include a tutorial guide to IMS/DC MFS applications design and programming. A perpetual license for FMTGEN is available for $7,500, with 12% added after the first year for maintenance.

PFK is located at 120 Wall St., New York, N.Y. 10005.

'PMO' Monitor Program Loads In IBM MVS Environments

SACRAMENTO, Calif. — Software Module Marketing, Inc. has introduced the Program Management Optimizer (PMO), an operating system performance enhancement for IBM systems running under MVS environments.

PMO was designed to monitor program load activity and to keep the user's most active Linklist directory entries in storage. The software reportedly requires no system modifications or initial program load requirements.

PMO is said to list frequently used reentrant programs, library usage and performance statistics.

The MVS version of PMO will be available for delivery on Sept. 1. It is priced at $4,000 for the first CPU and $2,000 for each additional CPU, the vendor said.

Software Module Marketing is located at 1007 7th St., Sacramento, Calif. 95814.

System Figures Estate Taxes

DALLAS — Software designed to assist users of Wang Laboratories, Inc. 2200 series computers in determining estate taxes due under the new tax law and in forecasting tax planning has been announced by Information Automation Corp.

The Estate Planning System enables attorneys or tax accountants to assess various estate plans, taking into consideration the estate taxes due upon death of the first to die and the amount due upon subsequent deaths of survivors, the company said.

The Estate Planning System is priced at $2,950 from Information Automation Corp., Suite 500, 2900 Turtle Creek Plaza, Dallas, Texas 75219.

'CPF' Eases IBM Printing

POULSBO, Wash. — An on-line print package that helps IBM CICS/VS programmers produce printed reports without special programming devices has been announced by Software Technology, Inc.

CPF allows a spooled report to be directed to multiple physical or logical destinations, while creating a report index at spool time to inform the user of the available reports, the vendor said.

The package uses Cobol and assembler programs under CICS and the network is maintained by an interactive Vsam file, the company said.

CPF is priced at $10,000 including one year's maintenance from Software Technology, Inc., 5492 N.E. Laura Court, Poulsbo, Wash. 98370.

Version 1.2 Of 'EZ-List' Out

EAST WILLISTON, N.Y. — Productive Software Systems, Inc. has released Version 1.2 of its two-part EZ-List, which writes RPG-II report programs through user responses to English prompts.

The first part, the D34 File Documentation Aid, allows data files to be described in English. The second part, the EZ-List RPG Report Generator, leads the user through the process of defining a report, then writes and prints the report, according to the vendor.

Capabilities of the new version include up to five files accessed in one report, full result field and arithmetic statement generation, automatically generated procedures and sorts, user-selectable forms type and copies and error checking.

A one-time license fee costs $1,450 from 27 Atlanta Ave., East Williston, N.Y. 11596.

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System/38 Package Tracks Equipment

GOLDEN VALLEY, Minn. — Elke Corp. has announced an on-line interactive package that allows companies using the IBM System/38 to control maintenance and cost-track equipment ranging from a lawn mower to a nuclear power plant.

The Equipment Costing and Maintenance System (ECMS) reportedly provides a single source of identification for each piece of equipment and plans, schedules and monitors equipment lubrication, periodic maintenance and safety inspections. It also is said to track the performance and cost of equipment usage, according to the vendor.

ECMS/38 procedures are run from user menus and multiple workstations can run the software at the same time, the vendor said. Data entry reportedly is interactive with on-line editing and immediate updating.

The software has been designed to facilitate interfacing with accounting systems or can be used as a stand-alone system. ECMS/38 is available for a one-time license fee of $10,000 from Elke Corp. at 998 Zane Ave. N., Golden Valley, Minn. 55422.

Transaction Module Out For IBM General Ledgers

RESEARCH TRIANGLE PARK, N.C. — A transaction history module for use with IBM's general ledger packages — Manufacturing, Accounting and Production Information Control System (Mapics) and Distributors Management Accounting System (Dmas), running on its System/34 equipment — was announced here by RLB Systems, Inc.

The module reportedly captures each month's detail prior to deletion at the close of the month and combines it with prior closed months' detail to form a summary of account transactions for the year.

The user can print this data for up to 300 separate accounts in a format similar to the preliminary general ledger, the vendor said.

The transaction file is copied onto a diskette after the period close procedure is run to completion, RLB said, noting the module can be used as an audit tool during the year and at year-end. The transaction history module costs $145 and is customer-installed. RLB can be reached through P.O. Box 12764, Research Triangle Park, N.C. 27709.

Insurance Firms Get Package For System/34

FALLS CHURCH, Va. — An on-line, interactive Insurance Company Accounting System (Icas) for the IBM System/34 has been unveiled by Dexel Systems Corp.

Icas was designed for small- to medium-size insurance companies in the general insurance, property/casualty and farm mutual industries.

The basic system provides for the creation and maintenance of a central data base containing all policy information.

The basic system costs $7,000, including documentation. Dexel is located at Suite 1200, 5203 Leesburg Pike, Falls Church, Va. 22041.

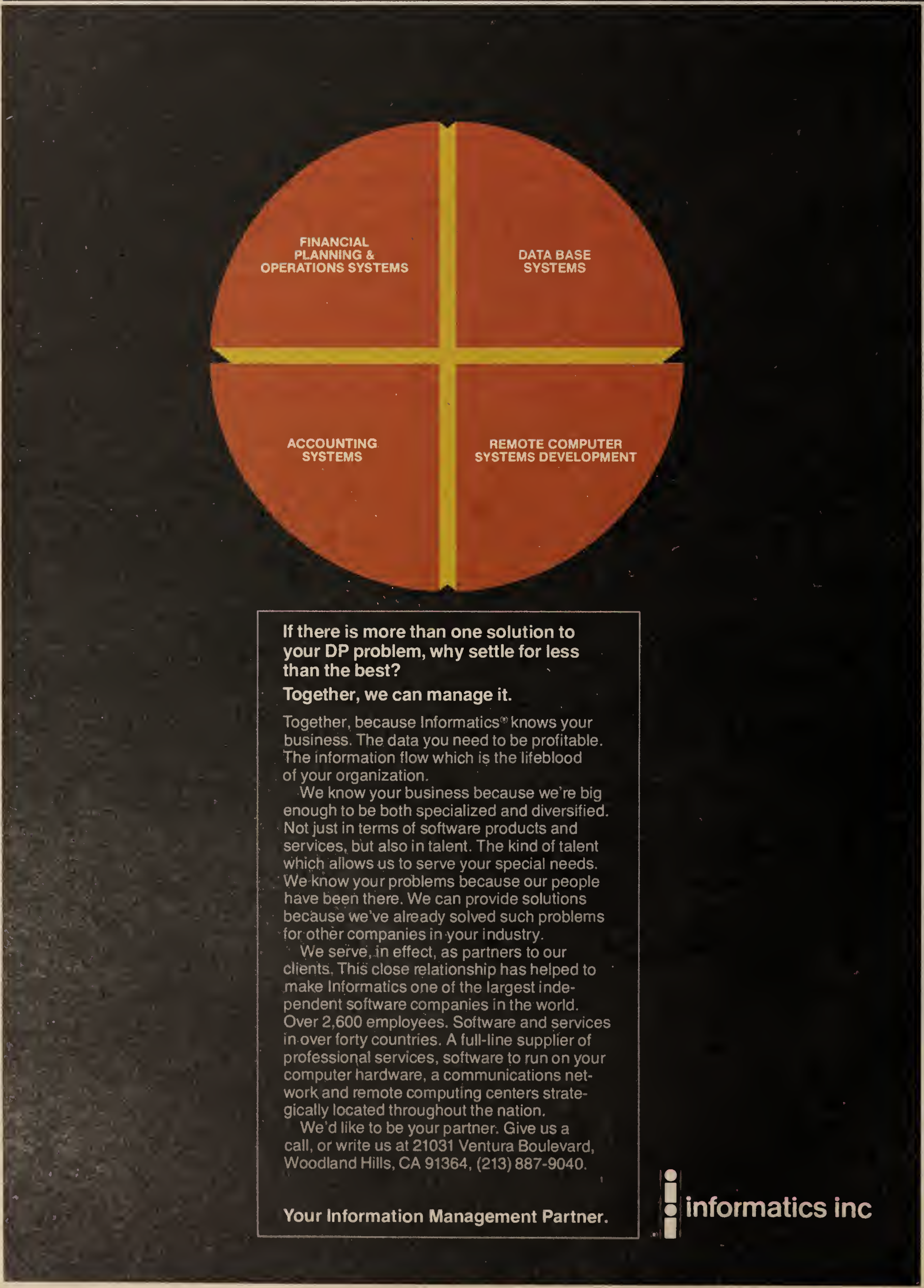
ADP Net Offers Project Control

ANN ARBOR, Mich. — An on-line interactive project evaluation and control system and fixed-price computing service for users of project management techniques has been announced by ADP Network Services, Inc.

Apecs 2000 features integrated time, resource and cost analysis, flexible reporting, data base management and management graphics, the vendor said.

Users receive processing capacity, on-line storage and network connect time sufficient to analyze and report on multiple project networks, each having up to 2,000 activities, the vendor claimed.

The Apecs 2000 service is priced at $4,900/mo from ADP Network Services, 175 Jackson Plaza, Ann Arbor, Mich. 48106.



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IBM Package Handles Membership Lists

WHITE PLAINS, N.Y. — IBM has introduced the On-line Membership System, a program that provides a group of functions for maintaining membership lists. Through interactive screens, users reportedly can maintain member/subscriber files and create renewal notices, mailing labels or promotion letters.

The software also is said to perform payment application and subscription fulfillment and is controlled by interactively created tables. In addition to list processing functions, the On-line Membership System features a query facility and report writer.

Users may interactively select records from the file based on combinations of member information contained in the record, the vendor said.

Selected records may be sorted and used for the creation of reports or computer-generated correspondence using the IBM Program Product Documentation Composition Facility, IBM added.

The monthly charge for the IBM On-line Membership System is $490 for 24 months, the vendor said from 1133 Westchester Ave., White Plains, N.Y. 10604.

Written in IBM Assembler

'Filecomp' Targets DOS, OS Users

BUFFALO, N.Y. — A file compare utility called Filecomp for IBM and plug-compatible systems operating in DOS or OS environments has been developed by Dataware, Inc.

Written in IBM assembler and utilizing a range of optional parameters, Filecomp reportedly provides reports and concise diagnostic aid messages. Report options allow printing in both character and hexadecimal format, as well as full or partial record printing, the vendor said.

Arithmetic sign parameters are said to allow for positive sign differences in display or packed decimal fields, and field options are designed to allow for the specification of key fields for file alignment after missing or extra records. The user also may specify fields to be omitted from the compare operation, according to the vendor.

Other options reportedly provide variable error record limits, the comparing of spaces equal to zeros and the specification of file types and record size.

Filecomp is available for $1,200 on an annual license basis with maintenance included, or for $5,000 for an ongoing license with maintenance charges added after the first year.

Dataware is located at 2565 Elmwood Ave., Buffalo, N.Y. 14217.

Insurance Tool Runs on DEC Gear

MIAMI — RVR Data, Inc. announced it is marketing Autoclaim, a software package for automated health insurance claims processing that runs on Digital Equipment Corp. Decsystem-20, Decsystem-10 and PDP-11 processors.

Autoclaim reportedly allows for both local and remote batch and on-line entry of claims.

Health care providers such as clinics, laboratories and group practices can submit claims from their place of business to a central host by way of programmable terminals, the vendor said.

The terminals will ensure that all mandatory claim data for private, Blue Shield and Medicare claims is present and correct at point-of-entry, a spokesman added.

Autoclaim, written in Cobol, is priced at $75,000 for a one-time license, which includes the first year's maintenance. RVR Data, Inc. is located at 3900 N.W. 79 Ave., Miami, Fla. 33166.

DEC Users Get Pascal-2 Compiler

PORTLAND, Ore. — Oregon Software announced the release of Pascal-2, its optimizing compiler for all Digital Equipment Corp. PDP-11 processors, including the LSI-11 and the VAX-11 in compatibility mode.

Designed with structured methods, the Pascal-2 compiler is said to include internal overflow and consistency checks.

The compiler was designed to produce portable programs and is itself portable, according to Oregon Software.

Optimizations include global register allocation, constant folding, dead-code elimination, short-circuit evaluation, expression targeting, array index simplification, branch-tail merging and common subexpression elimination.

Included in the Pascal-2 system is a source language debugger that reportedly helps uncover errors that cannot be caught at compilation time.

Pascal-2 is priced at $3,950 for a one-time license; support is included for one year. Support library sorts are available for an additional $700, Oregon Software said from its headquarters at 2340 S.W. Canyon Road, Portland, Ore. 97201.

Mark 3000 Net Adds Mapping From Harvard

CAMBRIDGE, Mass. — Harvard University's Laboratory for Computer Graphics and Spatial Analysis has announced the availability of its Aspex, Calform and Symap computer mapping software on the General Electric Co. Mark 3000 time-sharing network.

The software is said to allow portrayal of geographic-related information in two- or three-dimensional, color or black-and-white maps, output by a variety of computer peripherals, a spokesman said.

Courses taught in various U.S. cities by Harvard personnel to familiarize users with the software are offered under the auspices of the GE Mark 3000 time-sharing network.

Software fees are on an as-used basis, a spokesman said.

More information is available from Gloria Simmons, 520 Gund Hall, Cambridge, Mass. 02138.

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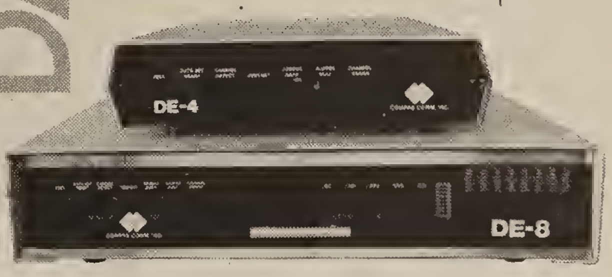

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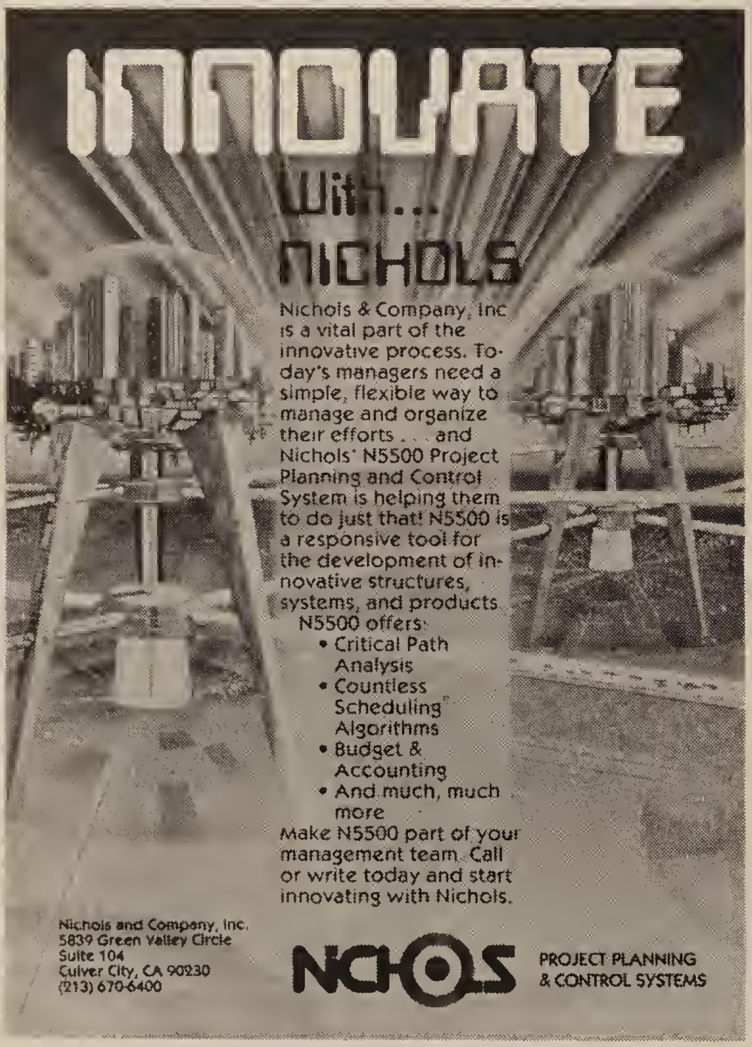
Prime Users Offered 'Queo-IV' Package

OLYPHANT, Pa. — Computer Techniques, Inc. has released Queo-IV, a package for Prime Computer, Inc. processors that reportedly provides nonprocedural methods for ad hoc inquiry, exception reporting, data entry and retrieval.

Written in a structured business language, BL/1, Queo-IV is said to use powerful programming verbs that minimize coding. BL/1's capabilities range from simplified screen formatting and form reporting to the support of relational and hierarchical data structures.

Queo-IV reportedly runs in a multiuser environment that allows simultaneous access of files. The software's data structures are compatible with existing applications in Cobol, RPG, PL/I and Pascal, the vendor said.

Queo-IV is priced at $9,600, Computer Techniques said from 1622 Main Ave., P.O. Box 282, Olyphant, Pa. 18447.



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DG Eclipse 350 Gets Systems Design Tool

CINCINNATI — An automated systems design methodology for the Data General Corp. Eclipse 350 has been announced by M. Bryce & Associates.

Pride provides the tools to control an organization's systems development environment with software written in Cobol, consisting of an Information Resource Manager and an Automated Design Facility, according to the vendor.

The system permits analysts to interact with the computer throughout the development process by creating a design for the information system, with system documentation automatically generated and maintained by the computer, the company said.

Pride is priced at $80,000 complete with training from M. Bryce & Associates, 1248 Springfield Pike, Cincinnati, Ohio 45215.

Order Entry Packages Fit DEC Financial System

FARMINGTON, Conn. — Computer Covenant Corp. has announced three application packages for Digital Equipment Corp. PDP-11 and VAX-11 processors that reportedly extend the capabilities of DEC's Integrated Manufacturing and Financial System.

The packages are order entry and invoicing, direct marketing and word processing.

The order entry package can allocate inventory from available stock, generate purchase orders and releases and can be interfaced to an accounts receivable package, the vendor said.

Direct marketing handles inquiries tc advertising and other promotional activities and the word processing package offers text editing functions plus the ability to access data bases, the vendor said.

The packages run on systems using the CTS300/500, RSX11M and VMS operating systems.

The order entry package costs $4,000 and the direct marketing and word processing packages cost $3,500, the vendor said from 790 Farmington Ave., Farmington, Conn. 06032.

'Accelerator' Introduced

MIAMI — Software said to generate Cobol code directly from screen displays on Honeywell, Inc. Level 6 processors has been announced by American Computer Center, Inc.

The Accelerator has an optional feature that will generate a program in which records for the related file will be created, updated or deleted and another option that will move backward and forward through the indexed file for ease in making changes in connection with a data input form, the vendor claimed.

The Accelerator is priced at $1,500 for the first application and at $1,000 for all applications thereafter from American Computer Center, Inc., 8510 N.W. 56 St., Miami, Fla. 33166.

System Reviews, Monitors Loans

ENGLEWOOD CLIFFS, N.J. — Resource Software International, Inc. has announced a loan monitoring system for Datapoint Corp. computers.

The package is said to provide control for the review of outstanding loans at regular intervals. Reports generated include listing of loans to be reviewed in selected month, listing of loans in violation of reporting policy and in selected categories.

One-time license fee for the package is $1,575 from the vendor at 140 Sylvan Ave., Englewood Cliffs, N.J. 07632.

Accounting Packages Out for NCR

SAN FRANCISCO — A series of accounting packages for the NCR Corp. 8000 and 9000 series computers running under the Imos, IRX or VRX operating systems has been announced by International Computer Technology Corp.

The packages include accounts payable and receivable, general ledger, payroll and fixed-asset accounting and are all interactive and may be used individually or as a total system, the vendor said.

The accounting packages are priced from $1,000 to $6,500 from the firm at 321 Bush St., San Francisco, Calif. 94104.

Patient Billing Fits Model 420

VENICE, Calif. — Scientific Data Systems, Inc. has released a Patient Billing System to run on its Model 420 Small Business Computer.

The on-line, interactive system produces statements and insurance forms, keeps track of receivables and analyzes financial statistical data for dental and medical practices.

The basic Small Business Computer consists of a CRT display, detachable keyboard, 8-in. floppy disk storage, computer and printer. RS-232 serial interface and RS-232 communication interface are standard. Price of the system is $13,500 and up. Scientific Data Systems is located at 344 Main St., Venice, Calif. 90291.

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'Side Door' Opens Ports

MOUNTAIN VIEW, Calif. — Kaufman Research Manufacturing, Inc. has announced a "side door port" said to enable a single terminal to talk to more than one computer.

The Side Door Line Interface Module (LIM) is said to free the computer from such tasks as protocol conversion, terminal emulation and polling operations. The device is said to eliminate any requirement for adding wires and switches and no modifications of the host or local CPU software are necessary.

The Side Door LIM reportedly can be employed to talk with any local computer with an asynchronous port. It is used in conjunction with the firm's True Port Concentrator.

True Port Concentrators are priced from $4,890 with one LIM with Side Door, to $10,595 for eight LIMs and eight Side Doors. For users who wish to add Side Door LIMs to concentrators in place, the LIM costs $815 from the firm at 2260 Mora Drive, Mountain View, Calif. 94040.

Micom Adds Concentrator, Cuts Prices

CHATSWORTH, Calif. — Micom Systems, Inc. has announced a data concentrator said to offer eight times the performance of its previous model at a lower price.

The vendor also announced price cuts on its band splitter and error controller.

The Micro800/2 data concentrator permits up to 16 data terminals, synchronous and asynchronous, to share a single telephone line, Micom said. It reportedly can be installed without special equipment.

Up to 16 input channels rated at 2,400 bit/sec usually can be concentrated onto a single 9,600 bit/sec line, a spokesman said. Prices begin at $1,850 for a four-channel model.

In addition, the Micro700 band splitter has been reduced from $1,200 to $995. The Micro500 error controller has been reduced from $995 to $795.

Micom is located at 9551 Irondale Ave., Chatsworth, Calif. 91311.

Timeplex, Inc.'s Alpha Star Network Manager

Timeplex Net Manager Predicts Line Failures

ROCHELLE PARK, N.J. — Timeplex, Inc. has introduced a network management system that it claims enables data communications managers to predict some types of line failures before they occur.

The Alpha Star Network Manager is a floppy disk-based microcomputer that permits users to monitor and control a statistically multiplexed data communications network consisting of up to 768 channels transmitting up to 32 independent data links from a single site, the vendor said.

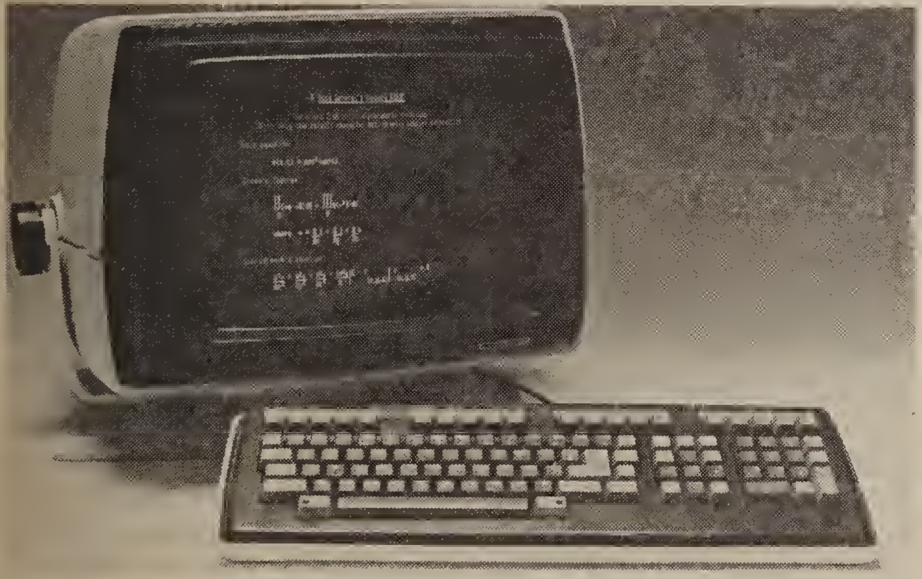
It operates through the supervisory port of up to 16 of the company's Series II statistical multiplexers to provide the capability of remotely configuring all channel parameters for any multiplexer in the network, the company claimed.

A report generated from the data base is automatically printed out every 24 hours or at any time by operator command, indicating what links are degrading and at what rate, the vendor said.

Available in two configurations, the Alpha Star Network Manager is priced from $13,750 to $14,500 from Timeplex, Inc., One Communications Plaza, Rochelle Park, N.J. 07662.

DG Unwraps Eight-Color Dasher

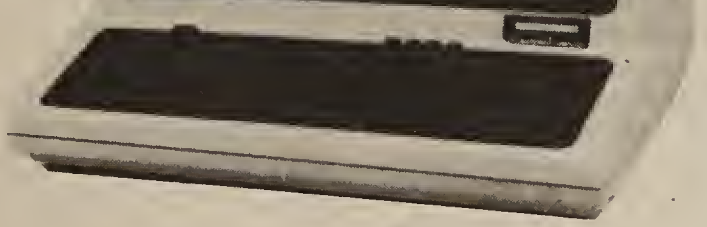
WESTBORO, Mass. — Data General Corp. has introduced an eight-color alphanumeric display terminal for interactive applications that sells for less than $4,000.


The Data General Dasher

The Dasher D280C was designed for engineering, scientific, business and industrial uses. Two sets of user-definable characters are said to provide 128 symbols in addition to the terminal's 128 upper- and lowercase Ascii characters.

Support for the terminal is provided by DG Eclipse, Nova and Micronova computers using standard software. The terminal is compatible with the Dasher D100 and D200 displays in single-color mode. Users can select seven transmit and receive speeds to 9,600 bit/sec.

The terminal costs $3,750 — $3,500 for the video display and $250 for the detachable keyboard — from Rt. 9, Westboro, Mass. 01581.



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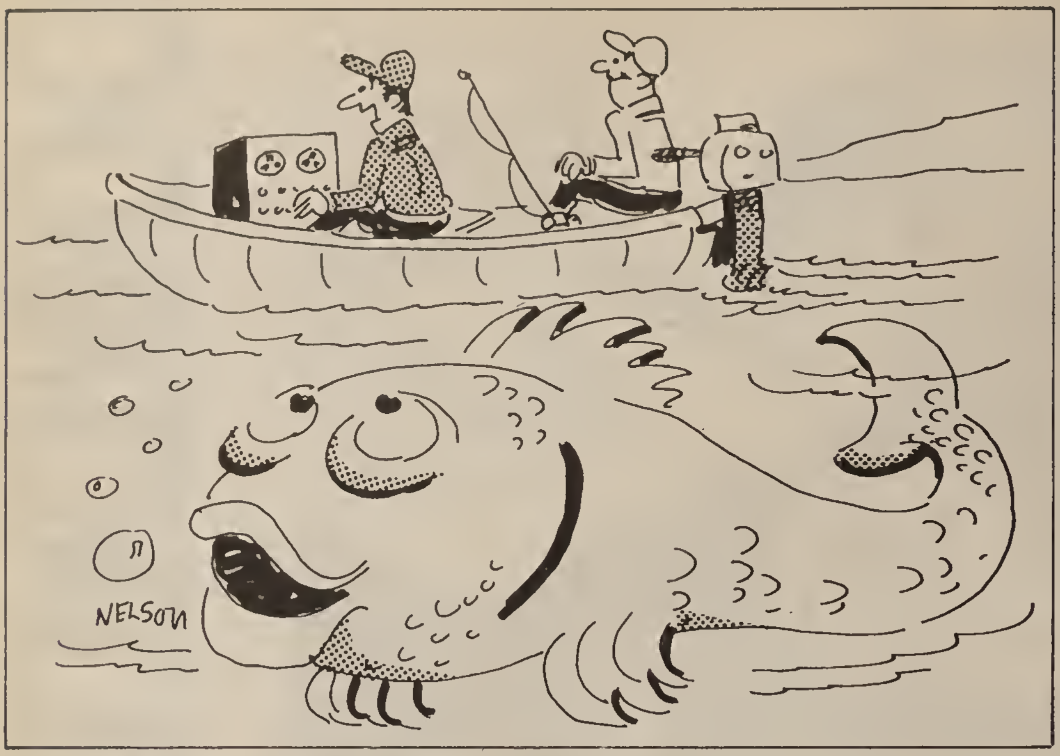

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Data Bits

Modem Designed For Full-Duplex Operation

LEXINGTON, Mass. — A modem designed for 1,200 bit/sec full-duplex operation on two-wire dial telephone lines has been announced by Concord Data Systems, Inc.

The CDS V.22 operates with both synchronous and asynchronous data terminals, provides speed fallback to 600 bit/sec full-duplex and can alternately function on two-wire leased telephone lines via an additional interface provided, the vendor said.

The modem also incorporates an automatic and adaptive equalizer that adjusts the receiver to compensate for telephone line distortion and drift, the company claimed.

The CDS VT.22 data modem is priced at $965 from Concord Data Systems, Inc., 442 Marrett Road, Lexington, Mass. 02173.

Network Design Tool Available at Low Cost

WELLESLEY HILLS, Mass. — A user-programmable network design tool costing less than $1,000 is available from Connections, Inc.

The NDT-7 is intended to be an inexpensive alternative for everyday use by the data communications professional. The portable system is said to perform all network design activities within its own customized firmware on a chip.

NDT-7 allows the user to perform multipoint line analysis and features a network configurator, the vendor said from 273 Washington St., Wellesley Hills, Mass. 02181.

Modem Out in 2-In. Unit Or Printed Circuit Card

LARGO, Fla. — A 9,600 bit/sec modem available in a 2-in. high package or in a 12-in. by 15-in. printed circuit card has been announced by Paradyne Corp.

The T-96 is designed for use in full-duplex, point-to-point applications and features training time of 253 msec, fallback operation rates of 7,200- and 4,800 bit/sec and diagnostic facilities that include operator-initiated local and remote digital loop-back testing, the vendor claimed.

The T-96 circuit card is priced at $2,715 and the packaged version at $2,740 from Paradyne Corp., 8550 Ulmerton Road, Largo, Fla. 33541.

Graphics Converter Out For DEC VT100 Terminal

SACRAMENTO, Calif. — Digital Engineering, Inc. has announced a graphics conversion package for the Digital Equipment Corp. VT100 alphanumerics terminal that can be installed by the end-user.

The VT640S consists of three printed circuit boards and enables the VT100 terminal to perform both as an alphanumerics terminal and as a graphics terminal, capable of emulating the Tektronix, Inc. 4010 series graphics terminals, the vendor said.

Optional features include vector drawing, point plotting, mode-independent selective erase standard cross-hair cursor and optional light pen and printer interface, the vendor said.

The VT640S is priced at $1,230 from Digital Engineering, Inc., 630 Bercut Drive, Sacramento, Calif. 95814.

Protocols Permit Oz Line To Fit Into DEC Teleprinters

MOUNTAIN VIEW, Calif. — Tri-Data Co. has announced that 8A1, 85A1 and 83B3 selective calling protocols are available for its Oz message station product line.

With the optional protocols, Oz will fit into Digital Equipment Corp. teleprinters, allowing them to be used in its private network, the vendor said.

The Tri-Data Oz configuration with a selective calling protocol is priced at $1,455 from Tri-Data Co., 505 E. Middlefield Road, Mountain View, Calif. 94043.

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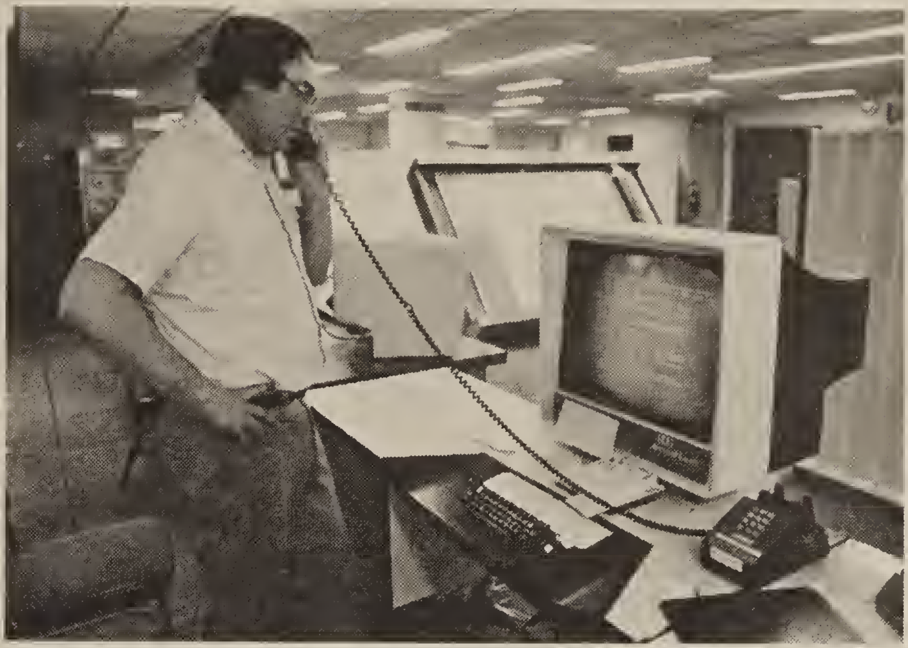
Automates Transportation Department

Wisconsin State System Rules Its Roads

The Wisconsin DOT's mainframe works in conjunction with a plotter to provide engineers with cross-sections for use in highway design.



When a law enforcement officer stops a driver, the call goes to a local dispatcher who in turn accesses the DOT's computer, as well as that of the Department of Justice. The officer gets information pertaining to the vehicle and driver within 10 seconds.

Special to CW

MADISON, Wis. — Wisconsin has never been one of those states that is associated with massive traffic problems. But there are three million drivers here, and keeping them on the road (or off the road, if necessary) can be a problem.

By computerizing its operation with two Amdahl Corp. 470V/6 processors, the state's Department of Transportation (DOT) has increased accuracy by 20% to 30% and has beefed up productivity.

"In an era of government cutbacks, it is important for every government agency to run the tightest ship possible," said Mike Bacon, director of the Bureau of Systems and Data Processing for the DOT.

The department is responsible for planning and administering a uniform transportation system for the state. "We are not another highway department that has been renamed 'transportation'," Bacon said. "We are responsible for mass transit, harbors, railways, bikeways, airports and, in addition, the regulation of the flow of goods within the state. The department's responsibilities also include motor vehicle registration, licensing drivers and safety."

As the department acquired additional responsibilities, it simply outgrew its old computer. Further programs could not be added and response time was increasing. To remedy the situation, department management worked out a model that indicated computer requirements for a three- to five-year period. Those requirements included an ability to execute three million to four million instructions per second and an uptime of 98% to 99%.

The first Amdahl processor was installed in October 1977. However, at that time DOT management had not planned on becoming a regional computing center. When the center went regional and its system had to serve six more agencies, the need for another computer was overwhelming, Bacon said.

The second V/6 was installed in October 1980. Currently, 80% of the computers' time is used by DOT, and the remaining 20% is used by the other six agencies, Bacon said.

The two Amdahl V/6s have 8M bytes of memory and 16 communications channels each. There are 42 spindles of IBM 3350 disk drives and 13 IBM 3420 tape drives. Four hundred and fifty IBM 3270-type terminals are scattered throughout the state, as well as 17 remote job entry terminals in eight different locations. All terminals are connected to the computers via leased telephone lines.

The processors use IBM's MVS/SE operating system and two data base management systems, one IBM's and the other an in-house system. The query function is served by Informatics Inc.'s Inquiry/IMS and Mark IV, Bacon said.

A standard update can be accomplished in a matter of seconds. When the department is notified of a change (via mail or telephone), an operator enters either the driver's license number or the driver's name, sex and birth date into the system. The driver's record then appears on the screen. The operator moves a cursor next to the line to be changed, types in the new information and presses a button to enter the change directly into the data base.

Wisconsin DOT's computer system has five major data bases: driver's licensing, motor vehicle registration, finance, engineering and planning. Almost 55% of computer time is involved with driver and vehicle registration. The department issues 3.1 million driver and vehicle renewal notices per year, 1.5 million driver's licenses and 1.3 million titles annually. It also handles approxi-

(Continued on Page 46)

Bits & Pieces

NCR Adds Fiche Units

DAYTON, Ohio — Two microfiche readers designed for office use and featuring large angled screens and precision fiche carriers have been announced by NCR Corp.

The 4601-01 is a full-size computer output microfiche (COM) reader and the 4601-02 has been engineered for dual use as a full-size document microfiche reader and a ⅞-size COM reader, the vendor said.

Options and accessories include drop-in interchangeable lenses in magnifications of 24X, 42X, 48X and 72X, a switchable dual-lens mechanism and choice of permanent screen-centered scribe or movable line guide, the company claimed.

The 4601-01 is priced at $280 and the 4601-02 at $260 from NCR Corp., Dayton, Ohio 45479.

Digitizer Size Boosted

FAIRFIELD, Conn. — Summagraphics Corp. has introduced a new version of its digitizer available now in sizes up to 42-in. by 60-in. while maintaining a resolution of .001-in. despite changes in temperature and humidity.

A variety of interfaces are available, which permit the digitizer to enter data directly into a central processing unit and also allow the host computer to control other functions of the digitizer through its microprocessor.

Summagrid is priced from $6,000 to $10,000 depending on grid size from Summagraphics Corp., 35 Brentwood Ave., Fairfield, Conn. 06430.

Portable Terminal Bows

GRAND PRAIRIE, Texas — Pinetree Systems, Inc. has announced the Data Prompter 2002, a portable two-way intelligent communicating data entry terminal.

The unit does not require a modem or external processor. It sends and receives alphanumeric data via telephone, radio, microwave or satellite communications, according to the vendor.

Units cost between $500 and $900, the vendor said from 734 Greenview Drive, Grand Prairie, Texas 75050.

Key-to-Tape Unit Out

SAN DIEGO — Innovative Data Technology, Inc. has announced a stand-alone key-to-tape system, the Medi-Vert 2001, that can convert or edit ½-in. IBM-compatible tapes in a seven- or nine-track format.

The stand-alone unit can accept densities of 200-, 566-, 800- and 1,600 bit/in. Tapes can be written and read in binary, Ascii, Ebcdic or other customer-selected code, the vendor said.

Units cost from $15,000, the vendor said from 4060 Morena Blvd., San Diego, Calif. 92117.

Empire Gains Option

CARSON, Calif. — To complement Tarbell Electronics, Inc.'s Empire Series System, the firm has introduced a 19-slot mainframe option.

While the Empire Series normally comes with an eight-slot mainframe, the 19-slot option can be purchased as part of the computer or as a separate item. In the latter case, the package includes motherboard, cabinet and 30A power supply.

The 19-slot package carries a six-month warranty on parts and labor. The Empire 119 computer with single-sided drives costs $5,288; the Empire 219 with double-sided drives costs $5,733 from the firm at Suite B, 950 Dovlen Place, Carson, Calif. 90746.

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The knowledge business

Wisconsin System Rules Roads

(Continued from Page 43)

mately 400,000 inquiries each month, varying from a standard record change (for example, a change of address for the license holder) to law enforcement inquiries, Bacon said.

A law enforcement inquiry takes approximately 15 to 20 seconds from the time the officer radios in until a response is received. The officer radios from a patrol car to a dispatching station that is connected to a Wisconsin Department of Justice processor.

That computer is connected by two high-speed telephone links to DOT's V/6s. When the request for the driver's check is received, the DOT computer automatically runs a license and a vehicle registration check, while the Department of Justice processor runs a stolen car check and an outstanding warrant check. Within 10 seconds, the vital information is on its way back to the officer on the scene, Bacon said.

Should the driver be cited and then found quilty, the court sends a copy of the citation to DOT.

An operator enters the record — date and type of conviction — and the computer automatically computes the number of "points" against the cited driver.

The name of any driver receiving 12 points within a one-year period then appears on a daily report and he is advised that his operating privileges are suspended or revoked.

DOT also processes almost 600,000 vehicle registration transactions each month. Changing the title on a car used to be a lengthy process taking three to five weeks. With the new on-line computer system, it is a matter of 20 minutes in person, or three to five days via the mail.

Accuracy Up 30%

According to Bacon, the accuracy of the information at DOT has increased by 20% to 30% since the installation of the V/6s, and the department has been able to deploy almost 100 employees to work in other areas during the four years since the installation of the first computer.

DOT also uses its processor to help design highways and bridges. Aerial photographs are taken and, with the help of a plotter, recorded onto a tape that is then fed into the V/6, providing the engineer with the contours of the ground surface.

Next, the geometric information regarding the grade, curvature and physical parameters of the highway are entered.

The other six agencies served by the Regional Computing Center use the computer for such things as income tax processing, issuance of hunting licenses, snow mobile and boat registrations and general accounting.

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Small Business Graphics — Part 1

Micro-Based Graphics Readily Available

By Tim Scannell
CW Staff

About a decade ago, a large European oil company decided to construct a graphics computer system that would track distribution, inventory and future supplies. The firm concluded after several months of study that such a system would call for $250,000 worth of hardware and nearly seven months' work to develop the software.

A respectable sum, considering inflation and the value of the dollar in the early 1970s.

If the same company wanted to develop an identical graphics system today, however, it would probably be based on a microcomputer and cost about $3,000 for the whole package, according to Carl Machover, president of Machover Associates Corp. in White Plains, N.Y.

"The resources that are required today to accomplish a very broad range of business planning are readily available on microcomputers and there's a strong indication that the business person is beginning to take advantage of it," Machover explained.

The small- to medium-size business community is on the verge of a boom in the use of business graphics. Presently, about 5% to 10% of the small business sector actually uses computer graphics as part of their daily operations.

Next week, in the final half of this series, we'll look at a company that is using microcomputers and graphics in day-to-day operations and discuss some of the problems of business' acceptance of graphics in general.

But, in a Frost & Sullivan report recently completed by Machover on computer graphics and business applications, the graphics consultant predicts that use of micro graphics packages will grow at a rate of about 80% per year. In particular, Machover is talking about software and the use of such graphics packages as Visiplot and Visitrend, relatives of the highly popular Visicalc, and all marketed by Personal Software, Inc.

The small business user "has so much numeric data coming out of the system that until he can get some idea of what the relationships are, it's very hard to make use of that data," Machover stated. "And we use graphics because it helps us see relationships much faster."

What About Today?

But, what about today? Are the 10% of the small business people with microcomputers that have a graphics capability using graphics as a tool, or just as an interesting and aesthetically pleasing toy?

"In general, it's a luxury sideline," Machover explained. However, there are a few specialized systems, those offered by Hewlett-Packard Co., Integrated Systems Corp. and Chromatics, Inc., that are being bought primarily for their graphics abilities. And these systems are used for everything from inventory and sales forecasting to preparing professional-looking charts for internal presentations.

Mitchell Kapor, president of Micro Finance Systems, Inc. in Cambridge, Mass., and author of Visiplot and Visitrend, is less conservative than Machover in his viewpoint of the small business graphics community.

"I don't think [graphics] is being used in Mom and Pop grocery stores, but it is being used by small consulting firms and architects. In other words, by professionals."

Graphics Makes It Easy

According to Kapor, it is much easier for a person to present his boss or peers with a few charts or graphs explaining a point rather than it is to plop 40 pages of tabular output on someone's desk. And because you are using your own computer to prepare the graphs, rather than a service bureau or graphics arts firm, you can play with different graphs until you find the one that fits exactly your particular situation.

Unfortunately, because of their corporate size, most small businesses are understandably skeptical of saying it with pictures.

"The trick is getting the first machine in the door," Kapor noted. Generally, Kapor or a member of his sales staff will call on a prospect, ask him to pull out a numerical report and show that in about two minutes they can make up a graph of it and have it printed out.

"They don't have to send it out to the graphics department or to an outside contractor and can effectively communicate results to other people or use it as an investigative tool if they're trying to track certain historical trends.

"The selling point is that users have control of the process where they don't have right now," Kapor observed.

Northstar Stand-Alone Desktop Features Graphics Capabilities

SAN LEANDRO, Calif. — Northstar Computer, Inc. has introduced a stand-alone desktop computer with graphics capabilities. The company also announced an upgrade of its Horizon series of single-user computers, which will now include two multiuser configurations.

Priced at $3,999, the Advantage desktop computer includes a Z80 microprocessor with 64K bytes of random-access memory (RAM). It has a 12-in. bit-mapped CRT terminal display that is capable of producing bar charts, pie charts, plotted graphics and 3-D visuals.

This display is driven by an additional 20K bytes of RAM to support the bit-mapping feature, the company noted.

Other features of the Advantage include two integrated, double-sided, double-density floppy disk drives, an 87-key keyboard with 15 program function keys and self-diagnostic capabilities. Optional software that support the CP/M operating system and Northstar's word and data processing packages are also available, the vendor said.

Second Announcement

In a second announcement, the company introduced multiuser Horizon-based systems capable of supporting up to five users simultaneously. They are hardware- and software-compatible with the stand-alone Horizon small business systems.

The multiuser configurations, called TSS/5 and TSS/18, are priced from $2,508 to $3,022 per user, not including CRT terminals, for systems with five users and either a 5M- or 18M-byte Winchester disk, Northstar said.

The TSS/5 configuration adds an integrated 5¼-in., 5M-byte Winchester disk drive, a four serial port board and one 64K-byte RAM board to the stand-alone Horizon per user, according to the company. The TSS/18 substitutes a 14-in., 18M-byte Winchester disk for the 5¼-in. hard disk and offers an optional 13.4M-byte capacity ¼-in. tape cartridge for backup.

The Advantage, TSS/5 and TSS/18 will be available in September from 14440 Catalina St., San Leandro, Calif. 94577.

Enhancements Give DEC Minc Graphics, Floating-Point Unit

MARLBORO, Mass. — Digital Equipment Corp. has announced both hardware and software enhancements to its Modular Instrument Computer (Minc) used in laboratory research environments.

Enhancements include a graphics terminal, a floating-point processor and interfacing modules that reportedly extend the functional capabilities of the Minc-11, Minc-23 and Minc/Declab23 systems. The enhancements are available as field upgrades or as options on new systems. The firm also expanded the maximum main memory configuration for Minc systems from 64K- to 128K bytes.

The firm's VT125 terminal replaces the VT105 graphing terminal in Minc-23 and Minc/Declab23 systems. The VT125 reportedly provides 50% greater resolution than the VT105 and employs full bit-map graphics, as opposed to waveform graphics used in the VT105.

The optional floating-point processor, called the FPF-11, provides four to five times the computational speed as compared to previous Minc operations. In addition, a thermocouple interface module enables users to make direct temperature measurements through Minc systems. Each thermocouple preamplifier module can handle up to eight probes and the system can handle a total of 56 probes, the vendor said.

A foundation module enables users to create specialized modules for Minc systems. It incorporates wire-wrap connections on a printed circuit board in a compatible mounting with other Minc interfacing modules, according to the vendor.

Software enhancements include a new version of Minc Basic, now available on both hard and floppy disks, a block move function that can reportedly increase transmission rates and subroutines to support the additional hardware, according to DEC.

A Minc system with a PDP-11/23 CPU, a VT125, Minc Basic and the 128K bytes of main memory costs $17,500. The floating-point processor costs $2,900; the thermocouple module, $2,500; and the foundation module, $500, the vendor said from its headquarters in Maynard, Mass. 01754.

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Mini Bits

Turnkey Aids Blood Bank

NEW YORK — A turnkey system designed to handle the data processing needs of community and hospital blood banks has been announced by CGA Computer Associates, Inc.

The Blood Bank Processing System features a Data General Corp. Eclipse or Nova minicomputer, a disk drive, tape drive and terminals and special applications software designed by CGA, the company said.

Modules include donor profiles, file maintenance, report generation, group collection, laboratory and processing briefs and inventory/distribution application briefs, the vendor claimed.

The Blood Bank Processing System is priced between $45,000 and $135,000 depending on modules selected and hardware options from CGA Computer Associates, Inc., 369 Lexington Ave., New York, N.Y. 10017.

Integral Data Cuts Prices

MILFORD, N.H. — Integral Data Systems, Inc. has cut prices up to 23% on its Paper Tiger Models 4360 and 560 printers.

At the same time, the firm also announced a basic performance version of its 132-col 560 printer.

Effective immediately, the 80-col Model 4650 printer is reduced in price from $1,295 to $995; the Model 460 with graphics from $1,394 to $1,094; and the 132-col 560 printer with graphics from $1,695 to $1,394.

The basic version of the Model 560 does not include a graphics capability and costs $1,295, a company spokesman said.

Both the Models 460 and 560 printers utilize a nine-wire overlapping dot matrix print head and boast print speeds up to 150 char./sec.

Integral Data is located at 14 Tech Circle, Natick, Mass. 01760.

FWD8001 Fits Intel Drives

MOUNTAIN VIEW, Calif. — Scientific Micro Systems, Inc. has announced a single-board controller for Intel Corp. Multibus Winchester/floppy disk drives.

The FWD8001 operates on five volts from the Multibus backplane. Industry-standard disk drives can be connected to the controller to eliminate the need for external disk drive interface boards and special cables, the vendor said.

The unit supports the Shugart Associates, Inc. SA1000 and Quantum Corp. 2000 series 8-in. Winchester disk drives and the Shugart 800/850 floppy drives, the vendor said.

Units cost from $1,400, the vendor said from 777 E. Middlefield Road, Mountain View, Calif. 94943.

Micros Get RAM Card

SANTA CLARA, Calif. — National Semiconductor Corp. introduced a 512K-byte, add-in random-access memory (RAM) card designed for its own Series/80 microcomputers and compatible Intel Corp. System 2000/80 microcomputers.

The Board Level Computer (BLC)-0512 carries 512K bytes of 64K-byte dynamic RAM MOS on a standard Series/80-size card, the vendor said.

The BLC-0512 is available at a cost of $3,475 per card. Quantity discounts are available and delivery is 30 days from receipt of order, the vendor said from 2900 Semiconductor Drive, Santa Clara, Calif. 95051.

Memory Storage Refigured

FORT LAUDERDALE, Fla. — A high-density memory using 64K-byte random-access memory (RAM) chips and said to be the first memory storage board with a storage density of 1.5M bytes per board has been announced by Harris Corp.

Memory features include single bit error correction and double bit error detection and the boards have an error-logging capability as well as the ability to force memory errors at any address for testing purposes, the company said.

The memory boards configured with a controller and with 768K bytes to 1,536K bytes of memory are priced between $12,500 and $22,500 from Harris Corp., 2101 W. Cypress Creek Road, P.O. Box 620, Fort Lauderdale, Fla. 33310.

Line Printer Adapter Out

COLUMBUS, Ohio — DBM Engineering Co. has announced a Burroughs Corp. line printer adapter that supports Dataproducts Corp. and compatible line printers as replacements for Burroughs Model A9249 printer.

The unit attaches between the processor I/O panel and the printer. Replacement printers can offer a higher printing speed than the Burroughs A9249 and the adapter will support either two-channel or 12-channel vertical format units, the vendor said.

The adapters cost $695, the vendor said from 14080 Lake Shore Drive, Columbus, Ohio 43204.

Interface Ties DEC Units

HUNTINGTON BEACH, Calif. — Ranyan, Inc. has announced a peripheral processor interface that allows two Digital Equipment Corp. LSI-11s or an LSI-11 and a PDP-11 processor to be linked in a host-satellite configuration.

Called the PPL-1 Link, the interface allows processors to share up to 32K bytes of main memory in switch-selectable increments of 4K bytes. Sixteen vectored interrupts are provided to implement a communications protocol between the two processors and the processor link is composed of two quad-size circuit boards, the vendor said.

The processor link costs $1,595 for Q-Bus versions and $1,995 for Unibus versions, the vendor said from P.O. Box 790, Huntington Beach, Calif. 92648.

Power Conditioner Debuts

SAN DIEGO — Topaz, Inc. has announced a 500 VA line 2 power conditioner for small business computers.

The unit offers protection from power line noise, voltage sags, surges and brownouts by using a noise suppressor and ac line regulator, the vendor said.

A 50Hz unit costs $480 and a 60Hz unit costs $430 from 3855 Ruffin Road, San Diego, Calif. 92123.

Simplifying Training With Job Aids

By Paul Harmon

There was a time, not too long ago, when computer hardware and software were very expensive. At that time, most vendors supported their products with week-long workshops taught by experts, with field technicians who practically lived at the client's office, by telephone hotline systems and numerous other training and support operations.

Training experts were rarely called in to consult with computer companies. The companies were so concerned with keeping up with the competition in technical areas that they ignored thinking about how to develop cost-effective training. Instead, they concentrated on simply providing technical experts whenever the client encountered any difficulties.

In recent years the costs of hardware and software have plummeted, competition has grown and profit margins have narrowed. Elaborate, expensive and often ineffective training and support operations have become increasingly difficult to justify. Computer companies are beginning to wonder how they can make their training most cost-effective.

A few years ago, IBM decided to move away from workshops as the primary way of training new clients and began investigating the problems involved in developing self-instructional manuals as a more cost-effective way of delivering training. With the introducation of its new word processing system, the Displaywriter, IBM has significantly challenged existing training practices.

The Displaywriter is not only priced so as to severely challenge its competition, but it comes with an elaborate system of customer diagnostics and self-training. IBM clearly intends to reduce the cost of its training and support operations at the same time it reduces price.

I suggest the '80s will witness vigorous competition among computer vendors in the area of customer training. The race will go to those vendors who are clever enough to support quality products with training systems that are both inexpensive and effective.

This means many companies are going to have to rethink entirely what is involved in training customers. It will mean not only spending money to develop more effective training materials, but also rethinking when and where training experts should be involved in the system development process.

Training designers are typically engaged much too late. As a result, they are forced to expend a large portion of the training budget on teaching client personnel to deal with hardware or software idiosyncrasies that could have been eliminated had someone who understood the training implications of various decisions been involved earlier in the process.

This article is written to focus the attention of computer personnel on

(Continued on In Depth/2)

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IN DEPTH

Choose memorization when:	Choose job aids when:
• Response speed is very important. (More important than accuracy.) • Task is frequently performed. • Small errors won't have large consequences. • Reading instructions would interfere with performance. • Job prestige requires a memorized response.	• Response speed isn't as important as accuracy. (Small errors have large consequences.) • Tasks are infrequently performed. • Reading instructions won't interfere with performance. • Tasks involve many steps. • Task involves a complex decision-making process. • Small training budget available.

Table 1. Criteria to Be Used in Deciding to Use Job Aids or Memorization Strategy (Open-Ended or Heuristic Decision Aid)

(Continued from In Depth/1)

one of the ways a good training analyst can help package a new product.

Specifically, the focus is on one of the fundamental distinctions made by training analysts. It's the training equivalent to being able to distinguish between hardware and software. Mere acquaintance with this basic training discrimination can help anyone improve the way he thinks about how to package computer training.

Memorization vs. Job Aids

When considering a new problem, a computer systems designer soon makes a decision about which aspects of the problem could best be handled by hardware and which could be done more effectively via software. Different jobs and different systems require different mixes.

When a training analyst tackles a new problem, a first decision involves a choice between either an instructional strategy that relies primarily on memorization or a strategy that relies on job aids. To choose to design a training package using either of these approaches, the analyst must think about what the trainees will need to do on the job after they have completed whatever training they are given.

A *memorized response* implies recall and action without any intermediate process. For example, a person's response to a request for his or her home phone number is usually a memorized response — the person instantly says the number. Likewise, when asked what five times four equals, most of us simply blurt out the correct answer.

A *response guided by a job aid,* on the other hand, implies the use of some device that helps the individual to make the correct response. A secretary uses a job aid when using a phone book to look up a telephone number. A cook uses a job aid when he uses a cookbook to determine exactly what quantities a particular recipe will require. The income tax forms we use to report our taxes are job aids, as is the pocket calculator we use to solve arithmetic problems.

Memorized responses allow a person to respond quickly. However, although a person taught to use a job aid will be slower to respond, he will respond generally with more accuracy. In addition, a person with a well-constructed job aid can respond to a much wider range of situations than one who must retain all responses in memory.

Thus, a job aided strategy is the preferred instructional approach when

Category of Job Aid	The Response the Job Aid Assists the User in Making:
INFORMATION AIDS	Provide the user with names, numbers, codes, words, etc.
PROCEDURE AIDS	Provide the user with a step-by-step procedure to follow (when no decisions are required).
CLOSED DECISION AIDS (Algorithms)	Provide the user with a step-by-step procedure and direct the user in making all decisions (when the correct decision is always possible).
OPEN-ENDED DECISION AIDS (Heuristic Aids)	Provide the user with a step-by-step procedure and some of the criteria for making required decisions (when the correct decision is not always predictable).

Table 2. Four Categories of Job Aids

the task to be performed is very involved or complex. Equally important influencing factors are cost and effort. If we want to train someone to perform a job that is subject to frequent procedural changes — such as code or rate changes — the cost of changing a job aid is much cheaper and more easily and effectively accomplished than the cost and effort entailed in retraining an employee's memory.

One training expert, Bob Mager, reported that the use of a simple checklist/questionnaire completed by patients led to the avoidance of an estimated three to six months of instruction for physicians. Joe Harless, another training expert, maintains that a job-aid strategy is four to eight times cheaper than a memorization strategy after the initial training analysis is completed.

These cost advantages, coupled with the increased quality of training based on job aids, have led to the rapid development and widespread adaption of such approaches by training experts.

Table 1 suggests some of the criteria training analysts typically use to decide whether memorization or job aids will be more effective in a particular situation.

Types of Job Aids

So far, job aids have been described only in abstract terms. Sticking with abstract categories a bit longer, I have described in Table 2 the four general categories into which I normally subdivide job aids. These divisions represent responses the aids help the performer to make.

Obviously, a grocery list and a telephone book are examples of information aids. A map to a friend's house or a step-by-step set of directions for assembling a toy are examples of procedure aids.

Decision aids are more complex and take many forms. Hand-held calculators, for example, can serve as either closed or open-ended decision aids. Menus on CRT terminals can also serve either role. Table 3 gives some idea of the specific job-aid formats most commonly associated with each of the generic categories.

On the other hand, user's manuals and system documentation rarely function as job aids. Although designed as references, they are not really designed to be used during the performance of the job. They are sometimes designed to be used as a backup device for use in cases that are infrequently encountered. In any case, such references are generally so poorly designed that they are unusable.

Likewise, a computer is not, as such, a job aid. It can serve as a job aid only if it is programmed to offer appropriate assistance to users while they are actively engaged in performing their work.

Thus, defining a job aid turns out to be a bit trickier than it seems. It is easy to describe the function of job aids: they guide employees in the on-the-job performance of their work.

CATEGORY OF JOB AID (Function)	Lists/Dictionaries/ Indexes	Checklists	Labeled Diagrams	When-If Decision Tables	Flowcharts	Forms/Workshops	Menus/Cookbooks	Flipcharts/Wall Charts	A-V Presentations	Pocket Calculator with/without Program	Computer Screens with Menus, etc.	Computers Programmed to Simulate Particular Alternatives
	COMMON JOB AID FORMATS											
INFORMATION AIDS	✓		✓					✓				
PROCEDURE AIDS		✓	✓		✓	✓	✓	✓	✓	✓	✓	
CLOSED DECISION AIDS (Algorithms)		✓		✓	✓	✓	✓	✓	✓	✓	✓	
OPEN-ENDED DECISION AIDS (Heuristic Aids)		✓		✓	✓	✓	✓	✓	✓	✓		✓

Table 3. Formats Commonly Associated with Each of the Generic Types of Job Aids

However, it is harder to define the structure of an ideal job aid. In general, a good job aid describes the behaviorial steps users must take to perform their jobs. It omits all unnecessary information; otherwise, it becomes a reference that is too clumsy to be used during actual job performance.

The best job aids are elegantly simple descriptions of the tasks involved in performing a job. They are designed and formatted in such a way as to fit easily into the work space and to be quick and effortless to use.

Mastery Performance

Another way of thinking about the difference between memorization and job aids is to consider the differences between what we would like the trainee to be able to do at the end of a formal training period and what is sometimes called "mastery-level performance" — ideal on-the-job performance.

Normally, formal training is used to move employees to some submastery level of performance; they are then placed on the job. Employees trained in this manner necessarily go through a period of trial and error learning before they attain mastery-level performance. This is illustrated in Figure 1.

If we decide we want employees to leave the formal training class performing at mastery level, which usually implies a massive amount of memorization, we find the formal training period takes considerably longer and costs a great deal more. This strategy is illustrated in Figure 2 on Page In Depth/6. Hardly anyone really adapts this strategy, although a few courses claim to accomplish it.

By using job aids both during training and on the job, one can develop a third strategy. This third approach usually requires less formal training since some memorization, which always takes a lot of time, is eliminated. The use of the job aid on the job assures a considerably smoother and more rapid acquisition of the on-the-job skills necessary for mastery performance. This approach is illustrated in Figure 3 on In Depth/6.

A still simpler strategy might in-

(Continued on In Depth/6)

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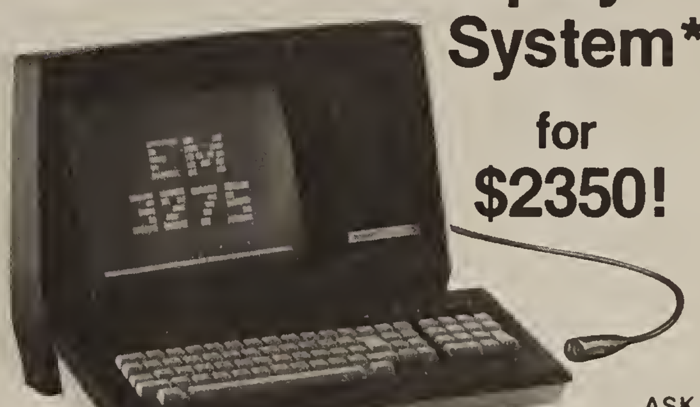

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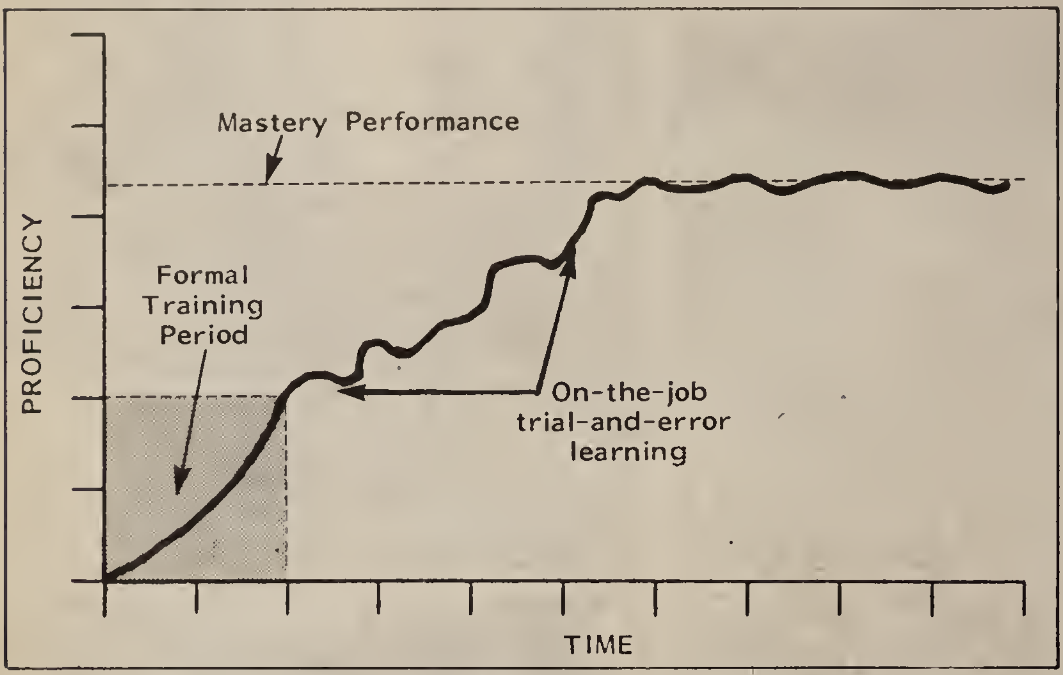


Figure 1. Normal Relationship Between Formal Training and Mastery Performance (Line represents typical trainee performance.)

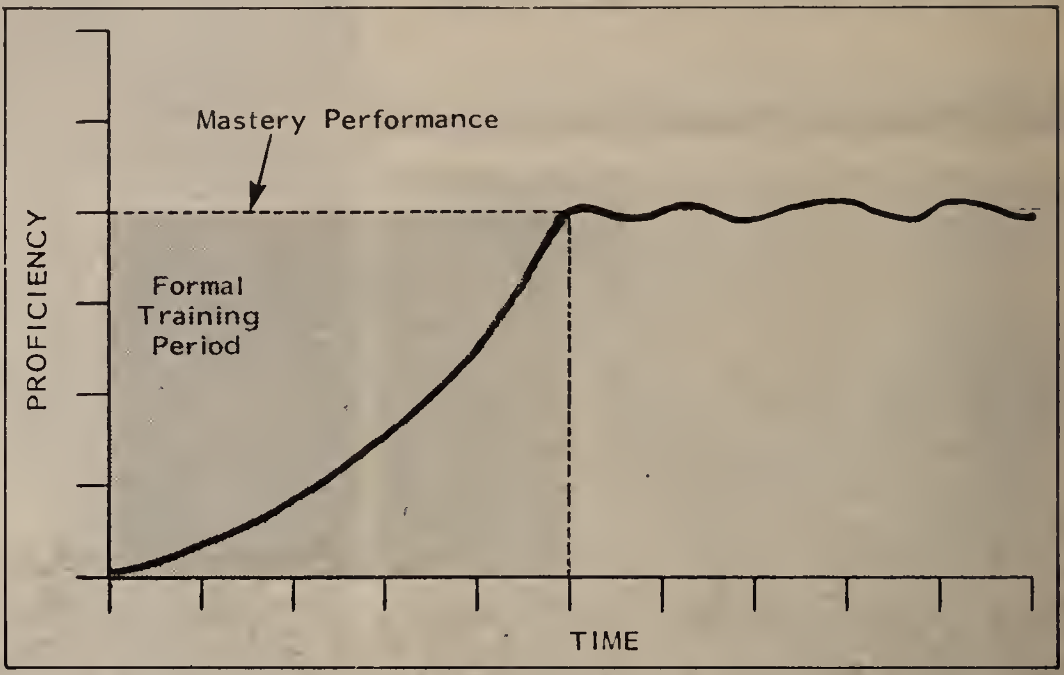


Figure 2. Formal Training to the Level of Mastery Performance (Line represents typical trainee performance.)

(Continued from In Depth/3)

volve giving trainees a job aid they could use immediately to perform at the mastery level. While theoretically possible, this approach cannot be used except in trivial cases. If the performance being taught is at all complex, effective use of the job aid will require teaching the student some overview of the job, including instruction (which is memorized) about when and where the job aid is to be used.

In fact, in order to minimize the information that must be included on the job aid, as much information as possible should be presented as overview and theory before introducing the aid. Job aids are most effective when they are compact and simple to use; if a little memorization can allow the trainee to use a simpler aid, the training and on-the-job performance are usually improved at minimal cost.

Retention Factor

Finally, regardless of how information is initially acquired, one question remains. How long will a trainee continue to remember the information?

Retention is the term learning theorists use to describe the period of time during which a new behavior is remembered. Assume that at the end of a training class all 10 trainees get 100% on a criterion test. We say this proves they have mastered the instructional content. If, four weeks later, all 10 trainees still get 100% on a similar criterion test, we would say they had 100% retention four weeks after the training class.

With only trivial qualifications, in the real world we find *trainees retain what they learn only if they frequently use what they learn on the job.* If knowledge or skills acquired during a training program are not called into use, they are quickly forgotten. Retention is not a property of any instructional strategy; it is an artifact of the job experience.

This is very relevant when one is choosing between memorization and job aids. If someone memorizes a series of steps making up a procedure and then does not use them on the job for several weeks, it is very unlikely that person will be able to go through the steps correctly when asked finally to perform the operation.

If, however, the employee is taught to use a job aid, the job aid will "remember." Whenever the employee needs to refresh his memory, he can simply review the aid. Thus, we avoid memorization whenever possible, not only because it takes a large amount of initial training time, but also because tasks used infrequently on the job are not retained accurately or long in human memory.

Many job aids serve a dual function as on-the-job training device and ready reference. Assume, for example, that we prepare a job aid composed of 20 checklists. During the training program we teach a new employee how to use the checklists and then place him on the job. During his first days on the job, the new employee uses the appropriate checklist when any of the 20 tasks is encountered.

After about two weeks, we find the

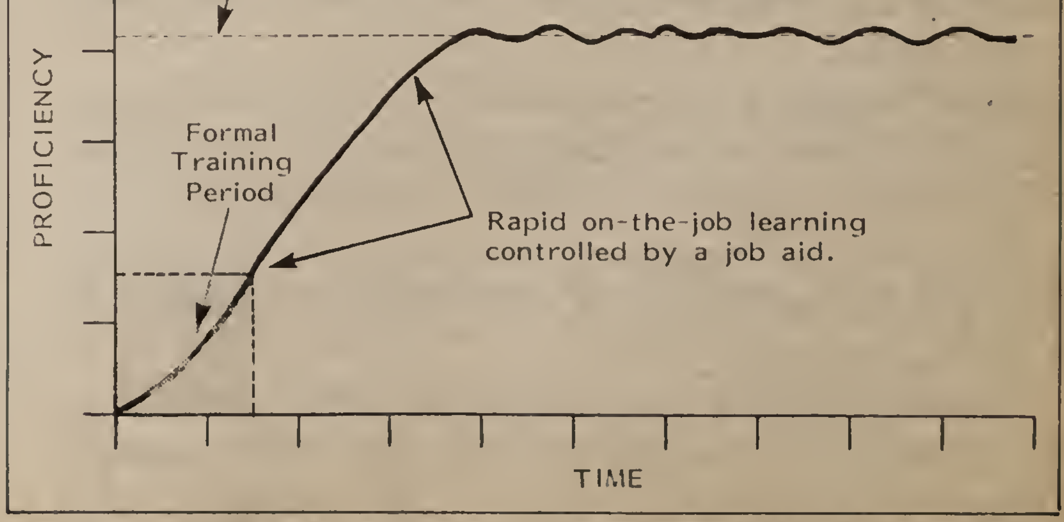
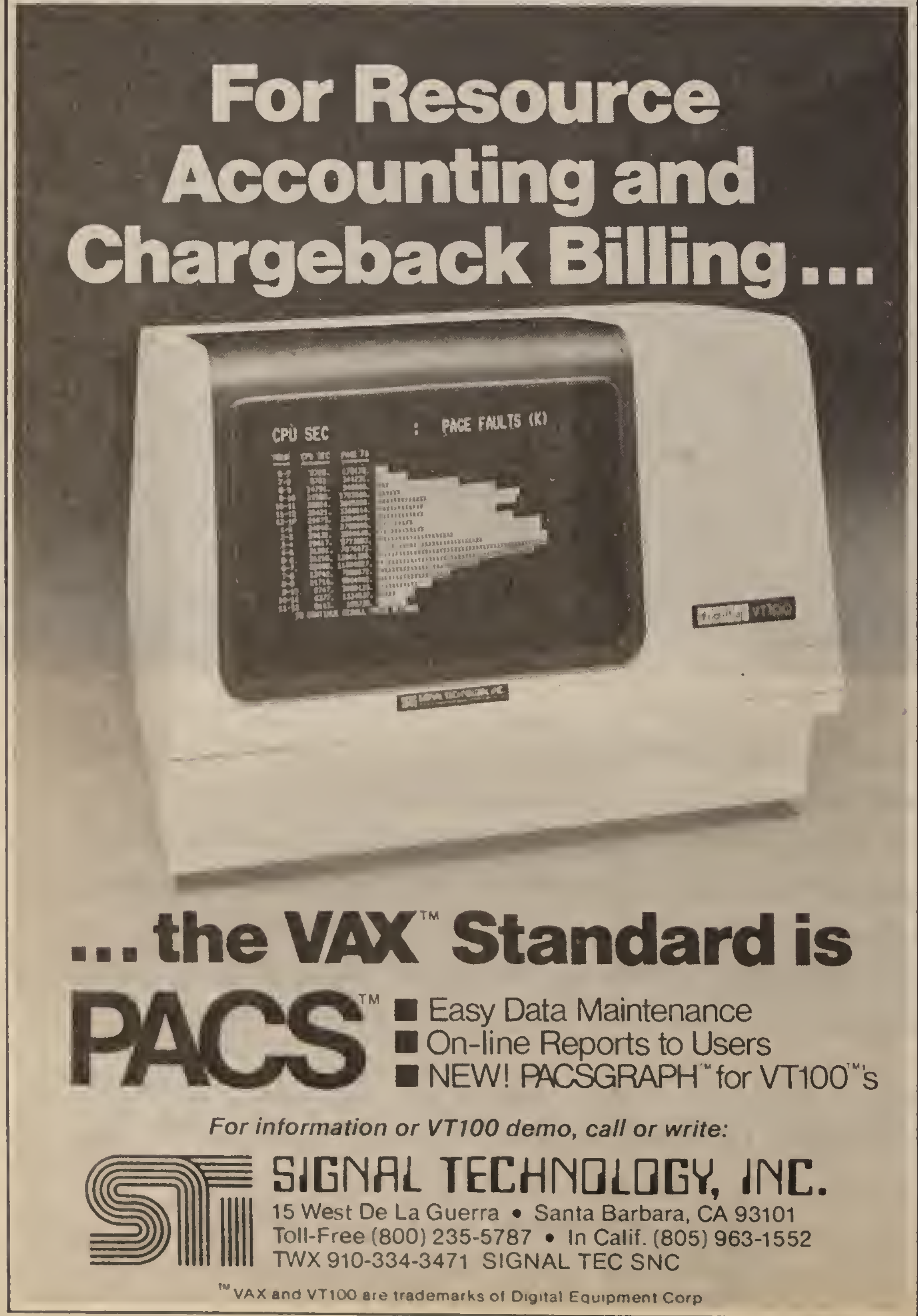


Figure 3. Job Aid Training Strategy (Line represents typical trainee performance.)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new employee no longer uses checklists 1, 4, 7 and 20. The tasks described in these four checklists are performed very frequently and the employee has memorized the steps required to perform them while using the checklists. In this case, the job aids provided on-the-job training and were able to be "dropped out."

Typically, when job aids describe tasks that are frequently performed, the employee simply uses the job aid until he has memorized the tasks and then stops referring to it. The employees in our example still use the other 16 checklists, which describe tasks that are performed much less frequently. Thus, the checklists served a dual role: they served as a reference for infrequent tasks and as an on-the-job aid to memorization for frequently performed tasks.

Some Examples

Because many clients still equate training with memorization, one is often forced to "hide" job aids in more traditional instructional packages. For example, I recently developed a self-instructional training program for one of the country's largest computer manufacturers. The program taught company personnel to implement and use a new data base management software package. The contract and the project managers insisted they wanted a text that presented information and then provided problems to ensure the readers "mastered" — memorized — the information.

The subject matter was very complex. The students needed to comprehend a complex software architecture in order to know how the package would classify, store and relate data. In addition, the students needed to master the numerous commands required to actually use the software. Some commands would be used only while initially implementing the system, but others would be used continuously throughout the life of the system.

We developed the self-instructional text as per contract and we added three types of job aids. To ensure that the users obtained a good overview of the architecture of the software package, we developed a color-coded wall chart showing each of the systems' data bases, the contents of each data base and the relationships automatically established when data was entered in any particular location. This "picture" of the system served as a heuristic job aid the user could post and consult when he wanted to analyze the implications of entering and deleting data.

A second job aid was provided in the form of several detailed checklists that summarized for the user the exact sequence of steps required to reach general agreement on the configuration of the system, the steps in installing the software, the steps in transferring Cobol data into the system and so forth.

Finally, we developed job aids for each of the sets of commands. These job aids indicated exactly how to format each command.

When the student read the self-instructional text, the text first provided an overview, then the appropriate job aid was introduced. Examples and then problems were presented to ensure that the student knew how to solve the problems while utilizing the job aid.

When the training package was used with a trial class, the students were all successful. Several asked if they could acquire the job aids independent of the instructional material. The client was happy with the results and proceeded to publicize and distribute the self-instructional text. I was happy because I knew the program would be successful in the field, since the job aids would ensure mastery performance on the job long after the client personnel had forgotten the specific tasks they learned while studying the text.

A more common assignment involves a request to train computer operators to use a new system in minimum time. In most cases, the client has developed a software application, is installing CRT stations and intends within the next month to hire 20 to 50 people to enter and update data, deal with customer inquiries and supervise the system.

In such cases, the training problem usually involves teaching the opera-

(Continued on In Depth/8)

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tor to transfer data from some kind of application or change-request form to a CRT screen, or to locate and obtain data from one or more CRT screens to answer some inquiry. Thus, the essential task involves following a step-by-step procedure that may or may not involve decisions on the part of the operator.

If the application forms and the CRT screens are the same, the procedure is relatively straightforward. Often, however, the two do not match and this makes the procedure more complex.

The only tricky part of such an operation arises when the operator must classify data or make decisions about data. Sophisticated programs can provide menus and algorithms to assist the operator, but most of the programs we have dealt with do not do so. Usually, the programmers had enough problems just getting the program to do its primary function in the time they were allowed, without trying to build in a lot of hints and aids for the entry operators.

In such cases, we usually develop a job aid for each operator — entry, editing, updating and so on. The procedural steps are typically on one side of a card and algorithms are referenced on the reverse side.

An 8½-in. by 11-in. booklet of approximately 20 pages normally accompanies each job aid. The booklet provides an overview of the task, introduces the job aid, provides one or two case studies to walk the operator through the use of the job aid and then offers several additional cases on which the operator can practice. Answers to practice problems are provided to ensure that the operator gets consistent feedback while learning to use the job aid.

Trainees usually read the booklet and work through the exercises in one to two hours. They begin to perform their jobs, assisted by the job aid learned while working through the instructional booklet. Using this system, we have consistently trained new terminal operators to perform flawlessly and be productive on their first day on the job.

In summary, just as computer designers have developed exciting new systems and techniques throughout the last two decades, training analysts have been rapidly developing new conceptual and technical approaches to cost-effective training.

The distinction between instructional strategies that rely on memorization and those that rely on job aids is one of the most important of these conceptual developments and will undoubtedly play an important role during the '80s as vendors seek to provide their customers with effective training at competitive costs.

About the Author

Paul Harmon is the president of Harmon Associates, a San Francisco-based company that specializes in sales training for the financial and computer industries. He teaches a course in the analysis and design of computer-related training in the Educational Technology Department of San Francisco State University.

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SPECIAL REPORT

Input/Output: Pulling It All Together

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Nonimpact Printers Boast Soaring Popularity

Special to CW

Nonimpact printing — that is, using printing techniques in which the paper is not struck by a hammer, typeball, chain or whatever — has grown enormously in popularity over the past 10 years.

Total shipments of nonimpact printers were about $945 million in 1980 and have now passed the billion dollar mark. Total shipments of more than $1.2 billion are expected for 1981, rising to $3 billion by 1986.

The first sector of the market to develop strongly was the "small" end, as Texas Instruments, Inc. and other suppliers produced data terminals using thermal printing technology. Then, in the mid-'70s, Xerox Corp. and IBM developed printer versions of their high-speed copier/duplicators and succeeded in penetrating a growing number of large computer center sites.

There, the ultra high-speed printers (costing $250,000 and more, and using electrophotographic technology) typically displaced three or four impact printers and allowed printing to be done in an 8.5-in. by 11-in. format, thus saving considerable paper and storage costs compared with the larger stock computer forms typically used in impact printers.

Nonimpact Disappointments

While nonimpact printing technologies were gaining at the top and bottom of the printer market during the '70s, the "middle" of the market saw a number of nonimpact disappointments.

Electrostatic printers from Gould, Inc., Versatec, Inc. and Varian Corp. never succeeded in moving out of the relatively small plotting/specialty segments. Inforex, Inc.'s magnetic printer never found a major market, Scope Data, Inc.'s effort in electrosensitive printers ended up being abandoned and Uppster's embryonic production status (with a medium-priced electrophotographic printer) at the end of the '70s was about the same as it had been 10 years earlier.

The trend throughout the computer industry for the past 20 years has been toward the replacement of more and more electromechanical subassemblies with all-electronic modules.

Nonimpact Printer Shipments, 1981-91

Shipments ($ Million)

Type	**1981**	**1983**	**1986**	**1991**
Electrophotographic	670	1,330	1,960	1,380
Thermal	300	430	650	550
Electrostatic	85	80	80	70
Ink Jet	90	140	320	500
Electrosensitive	60	80	70	70
Magnetic	3	6	11	15
Total:	1,208	2,066	3,091	2,585

This market outlook above summarizes the expected pattern of shipments of nonimpact printers worldwide over the next 10 years. The shipment estimates are presented in constant 1981 dollars, to which the user must add his own expectation of inflation.

This trend has been very significant in simplifying the mechanical designs of peripheral devices, by transferring the complexity of the device into the electronics and permitting complex mechanical motions to be performed with relatively simple assemblies.

However, for a medium-speed or high-speed printer, the necessity of handling paper requires that there are some considerable number of rollers, latches, microswitches and so on within the context of a reliable paper-handling system.

Paper-handling systems of any type are notoriously expensive and troublesome to design, but by chance a lot of money has been spent by the office copier industry — mostly by Xerox and a dozen Japanese competitors — on designing simple, inexpensive and reliable paper-handling and imaging systems for copiers.

It is, therefore, almost irresistible for a printer manufacturer to look first to the possibility of incorporating as much established copier technology as possible into a new nonimpact printer design.

In fact, the main thrust in the nonimpact printer market at the present time is in the direction of basing printer designs on existing photocopiers. And the major uncertainty in the nonimpact printer market lies in the probable user acceptance, pricing and competition in the medium-speed electrophotographic nonimpact printer market.

The first intelligent printers to be introduced to this market sector were IBM's 6670, Xerox's 5700 and Wang Laboratories, Inc.'s Image Printer, all of which are relatively expensive ($35,000 to $90,000) and all of which have met with relatively lukewarm market acceptance.

Although these devices are aimed at the "office of the future," the fact is that the office of the present does not yet have the infrastructure — in terms of networks, electronic filing systems, workstations and so on — that will sooner or later require the presence of intelligent printers to handle the paper output.

Chicken and Egg

There is thus a "chicken and egg" problem in that the components of the future automated office (such as workstations, electronic filing systems and intelligent printers) are not in themselves viable without the other components also being present; before the subsystems are viable the system must be in place and before the system can be viable all of the subsystems must be present.

Thus the future of the medium-priced copier-derivative nonimpact printer is linked with the future of electronic filing and other elements of the automated office, and some of these other elements are not as advanced, in terms of productivity and market introduction, as are the intelligent printers.

However, the introduction of low-cost intelligent printers, such as the recently announced $4,000 (OEM) product from General Optronics, will enable users to justify the procurement of these devices even in situations where their usefulness is marginal, and this should help solve the marketing problems that have characterized the intelligent printer market during the past two years.

Xerox and IBM have most of the top end of the market at the present time, with the 3800 and 9700 products. The Siemens Corp. ND-2 is very similar to the 3800 and is being resold by Sperry Univac and others. Honeywell, Inc. has an electrostatic printer that competes at the top end of the market — all of the other top end products are electrophotographic.

At the bottom end of the market, with strip printers for calculators and so on , Texas Instruments, Matsushita Electric Industrial Co. and Olivetti Co. are major vendors, and TI also dominates the thermal data terminal market (although there is strong competition in the latter sector from Computer Devices, Inc., Computer Transceiver Systems, Inc. and others).

IBM and Siemens are major vendors of ink jet printers. In the case of IBM, the printers are used in word processing applications, while Siemens uses ink jet technology for teleprinter terminals. Wang competes with IBM and Xerox in the intelligent printer segment, and this segment is likely to see the entry of a dozen or more vendors over the next year or two, some of whom will be procuring the equipment on an OEM basis from Konishiroku, General Optronics, Canon, Minolta and so on.

The market for specialty papers and supplies for nonimpact printers is a relatively small one, particularly by paper company standards. However, it has been a lucrative one. Although the markets for thermal and electrostatic specialty coated papers will continue to increase strongly, the most spectacular growth is expected in toners and other supplies for electrophotographic printers.

This story was submitted by International Resource Development, Inc.

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Gets Better Security Distribution

Blue Cross Saves More Than Money With COM

Special to CW

CLEVELAND — Blue Cross of Northeast Ohio, like other organizations heavily dependent on DP, has found that cost saving and return on investment are not the only factors in upgrading systems operations.

W. Bill Burke, manager of computer operations for the regulated health insurance plan, cites a recent changeover to in-house produced computer output microfilm (COM) as an example.

The initial benefits, Burke said, were lower materials costs and elimination of charges by an outside service company. A great quantity of fast turnaround computer output that had been printed on paper could now be quickly printed on microfilm, and less timely reports generated on microfilm by the company based here could be produced inhouse at lower cost.

"But less obvious and harder to measure in dollars were the improvements we made in security of sensitive information, more efficient working procedures, better distribution of data and increased flexibility in information management," Burke pointed out.

The Kodak Corp. Komstar microimage processor purchased by Blue Cross is a switchable computer output microfilmer that can be used both on-line and off-line. As Burke said, the impact of the processor extended beyond the return on investment bottom line. He brought up several examples.

Formerly All Paper

Prior to the changeover to in-house COM, Blue Cross' financial department relied entirely on paper reports. It was reluctant to allow any outside processing company access to the sensitive and confidential information contained in many reports.

Now the confidential data remains in-house at all times, and the financial department is one of the largest users of COM at Blue Cross. It has found that the 4-in. by 6-in. microfiche, each containing the images of more than 200 pages of printout reduced 42 times, are more secure than the paper reports.

A fire in a storage area a few years ago destroyed several years of inactive but valuable records that were stored in paper. Now, Burke said, the data can be kept in a fireproof vault. Because of the compact size of microfilm, seven years of records can be protected economically. In general, only duplicate microfiche are distributed to end users; the originals are kept available in the vault for ready access.

Blue Cross provides DP services for 11 Northeast Ohio hospitals. The Komstar microimage processor can be taken off-line to handle tapes forwarded from the participating hospitals. Where turnaround time formerly amounted to as much as seven days, reports generated onto microfiche can now be delivered the next day, giving the hospitals immediate access to timely information needed for efficient operation, Blue Cross claimed.

Burke emphasized that even less tangible benefits, such as increased security, or better information distribution, add up to cost savings in the long run.

"Our goal is cost containment of health services, and we see more sophisticated DP capabilities as a long-term way of ensuring the most efficient operations possible," he commented.

Pioneering Approach

Within the last several years, Blue Cross has taken a pioneering approach to upgrading its DP system. A large IBM CPU and a high-speed nonimpact paper printer were installed and a network of more sophisticated terminals scattered throughout the offices here were also put in.

Burke estimated that the processor saved $90,000 in materials costs alone during its first 12 months of use. The COM device uses a laser to write directly onto dry-processed microfilm, which can be either in the 4-in. by 6-in. microfiche format used by Blue Cross, or the 16mm roll microfilm required by some of the client hospitals. The firm's figures show that microfilm costs as much as 90% less than the equivalent paper output.

These savings mount up when special forms or two- and three-part forms must be used. Three copies of a report printed on paper typically cost about three times what a single printout runs, Burke said. But a single original microfiche, which costs Blue Cross about $1.10, can be duped with a Kodak Ektafiche duplicator for about 9 cents each.

These lower materials costs have had a direct effect on the budgets of the departments using COM, he said.

"We charge back for our services. For paper reports, there are two separate charges: one for time and one for the materials used. However, when a department receives a COM report it is charged only for the time.

"We absorb the materials cost," Burke explained. "The added incentive has encouraged users to roughly double their demands on the COM equipment each month for the first year."

Just Another Printer

Burke said the microimage processor was installed exactly as if it were just another printer. All of Blue Cross' output devices are on the same channel, and the company did minimal reprogramming of reports for output to microfilm. The processor, which operates unattended most of the time, has a machine-rated output speed of 10,000 line/min rate.

Since the laser COM unit was installed, Blue Cross has been able to eliminate one of its impact printers, and has off-loaded 35% of the output that had been going to the nonimpact paper printer.

An output of 1.4 million impact printer pages/mo was reduced to 800,000 pages, with usage costs for the nonimpact unit dropping $3,000/mo.

Diverting all that paper to microfilm has simplified handling. While Burke said 70% of the output is distributed only within the headquarters building in downtown Cleveland, a significant portion is sent by mail or courier to other Blue Cross plants around the state for which the Northeast Ohio company serves as a clearinghouse. Other reports are sent to hospitals that are due payments.

'Burke emphasized that even less tangible benefits . . . add up to cost savings in the long run. "Our goal is cost containment of health services, and we see more sophisticated DP capabilities as a long-term way of ensuring the most efficient operations possible." '

For these, the easier handling of microfilm is an important cost-saver. Several pounds of paper can be replaced by a single microfiche that can be mailed first-class at the one-ounce rate.

Though the initial materials' cost saving expected was realized, and a cascade of other benefits followed, Burke saved the most traditional microfilm advantage for last — space saving.

"Space is at a premium for us, of course, but it was our programmers who had the most need to eliminate paper reports," Burke said. "A disproportionate amount of our total computer printout remains within the computer department itself. Our programmers literally found themselves with no place to put stacks of paper."

Now Sysgen, final compiles, logs, listings and other output formerly printed on paper are made available in microfilm form, with space saving of 90%.

"Our programming people have found that they can keep an entire record of a program's development in a small folder, so that old data can be conveniently kept indefinitely," Burke said.

"But they find that the fast turnaround is another benefit. If a programmer has a problem, he or she can get an instant dump on the program, ready for viewing in a few minutes. Using paper printers, the wait could be hours, especially if the printer is backed up with other work," Burke said.

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Voice Synthesis Nearing Growth Explosion

Special to CW

Voice synthesis is on the threshold of a great market expansion, mainly because of developments in semiconductor technology. Three-chip voice synthesis systems are emerging from Japanese and American manufacturers.

The speech technology itself has advanced from simple D-to-A conversion systems that require more than 100K bit/sec of information at sampling rates of 12KHz to simplistic phonemic concantenation systems that work at 50 bit/sec and are programmable by microprocessors or mechanical switches.

Voice recognition, on the other hand, remains a difficult task. For any but the largest systems, based on 370-class CPUs with M bytes of memory, recognition is restricted to limited vocabularies, trained users and machines and adequate-to-good recognition reliability (accuracy).

The recognition market is getting increasing attention as the synthesis market develops. In its own right, recognition awaits breakthroughs both in very large-scale integration semiconductor technology and theoretical understanding of how humans hear and interpret what they hear.

Applications in both areas tend to be experimental, controlled, or in areas where performance is not critically evaluated, such as consumer-oriented products. The synthesis market has immediate consumer applications in games, clocks, watches, annunciators and so on.

The recognition market, so far, has precious few applications outside of data entry. Figure 1 shows Strategic's forecast for voice synthesis and voice recognition devices, board level and system level products.

Speech synthesis (voice output/voice response) sales will grow from $23 million in 1981 to $495 million in 1985, representing an average annual growth rate (AAGR) compounded of 115% per year.

	1981	1982	1983	1984	1985	AAGR (%) 1981-1985	1985 % OF TOTAL
SPEECH RECOGNITION							
Devices (Chips)	1	2	4	10	30	134%	20%
Products (Board Level)	10	17	36	70	100	78%	67%
Systems	4	6	9	13	20	50%	13%
Subtotal	$15	$25	$ 49	$ 93	$150	88%	100%
SPEECH SYNTHESIS							
Devices (Chips)	15	35	80	160	320	115%	65%
Products (Board Level)	5	12	25	50	100	111%	20%
Systems	3	9	20	40	75	124%	15%
Subtotal	$23	$56	$125	$250	$495	115%	100%
TOTAL	$38M	$81M	$174M	$343M	$645M	103%	

Source: Strategic, Inc.

Figure 1

The major applications will be consumer and novelty products. As a result, sales of the semiconductor devices themselves will be the largest market (65% of the total), followed by board-level products that will go mainly into computers, communications and office products (20%); the remaining 15% will be in stand-alone boxes and voice I/O front ends in large systems, mainly for applications involving telephone communications — order entry, credit verification and bank-at-home.

Texas Instruments, Inc. leads in chip sales, with some $3.5 million in the last 12 months. Revenues of board-level product vendors tends to be in the $1 million to $2 million range, with expectations of at least doubling next year.

The voice recognition market will trail voice synthesis both in volume (30% of the total in 1985) and AAGR. Recognition device, board and product sales will grow from $15 million in 1981 to $150 million in 1985, corresponding to an AAGR of 88%; not at all bad for an industry that still has not figured out how to understand normal human continuous speech, or to reduce its current knowledge to large-scale integration (LSI) implementation.

Voice Recognition Leader

The leader in voice recognition is Threshold Technology, Inc. with more than 600 systems installed, and revenues of $2.3 million for the year ending June 30, 1980. Interstate Electronics Corp. runs a very close second, with a comparable level of revenue.

The major driving forces in speech synthesis — which are contributing to excitement in voice recognition and voice response systems — are the improving algorithms for imitating human speech and the reduction of those algorithms to low-cost LSI packaging.

It is possible to get acceptable speech chips (not robotic, but clearly machine generated in this writer's opinion) for less than $15 in large quantities. Phonemic speech, typified by the Votrax SC-01, is available for just more than $7 in quantities of 250,000.

Large markets are needed for very low prices, and these markets are available in consumer electronics; hence, the pressure from the Japanese, who have a way of overtaking the U.S. consumer market for gadgetry electronics (such as watches, clocks, calculators and microwave ovens that "talk").

The high end of the automobile industry is another universal target of U.S. and Japanese "talking chip" manufacturers. So far, the U.S. and Japan are the only suppliers of these chips (except for an ITT subsidiary in Germany, which is only addressing the talking clock market).

Deterrents to the market expansion are mainly issues of user acceptance. Speaking devices are novel and fascinating. Some, like TI's "Speak and Spell," are functional, and hence, highly successful. It is not easy to develop an acceptable market for talking products unless:

- The users do not have to listen to the nonhuman voice too long or too often (telephone information, talking elevators and emergency annunciators).
- The mechanical voice is appropriate (clocks, washing machines and automobiles).
- The voice quality improves greatly (with corresponding increase in cost, or lead-time while waiting for technological improvements).

Examples of applications where voice synthesis/response products are advantageous (and hence worth listening to or waiting for) include:

- Hands-busy, eyes-busy situations, where it is also important to get information from another source — electronic instruments that speak meter readings while a technician is holding a probe on a circuit point; a vocal emergency message for an automobile driver.
- Aids to handicapped persons, which enable the blind to type (with vocal feedback) and the mute to speak.
- Repetitive, monotonous tasks of responding to an inquiry with numbers, such as telephone company information about changes in directory listings.
- Language translation, either in hand-held traveling units or for text-to-speech devices that read English text.
- Situations — particularly emergency (fire) — where specific in-

(Continued on SR/6)

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Communication Essential

Seven Steps for Effective Graphics Presentation

By Lawrence G. Biggs
Special to CW

Graphics seem to be used everywhere these days. You will see them in printed form in reports and magazine articles; they are also used frequently in oral presentations ranging from speeches to staff meetings to sessions of boards of directors. Presentation graphics — the visual representation of information used with an oral or printed presentation — can be very effective.

This discussion identifies seven key presentation factors that must be considered if effective presentation graphics are to be developed. These factors include the audience, the message, the purpose of the presentation, the medium to be used to generate and present the graphics, the budget for the project and how much time is available to produce the project.

The seventh consideration, aesthetics, is determined by the relationships among the other six. This discussion touches briefly upon all seven factors, but focuses in detail upon aesthetic factors and media, including equipment and technologies.

Transparent Graphics

The purpose of presentation graphics is to help convey the message of the presentation and to emphasize, clarify, or add visual appeal to that message. Graphics are not the end, only the means to an end: clear communication.

To be truly effective, presentation graphics must be transparent. That is, the graphics should communicate or emphasize an idea without making the audience (or receiver of the message) aware of the presence of the graphics.

Good presentation graphics do their job without calling attention to themselves and thereby distracting the audience.

Transparency can only be achieved by thoroughly understanding the auidence, message and purpose and balancing this understanding against the medium, cost and time available. Most presentations (the message) are given to a known audience for a given purpose; the medium, the dollars to be spent and the time to be used should be decided upon accordingly.

A brief look at the nature of the audience and at the purposes of presentations reveals why aesthetic considerations are important. Many of us in our daily work lives give presentations to many types of people including customers, vendors, managers, peers, subordinates and the general public.

In these presentations, we may try, for example, to sell products and ideas, communicate concepts, report the status of a project or train someone to perform some activity. Clearly, it is necessary to tailor both the words and the images we use to the nature of our audience and our message. Being aware of the aesthetic resources available for graphics can help us produce better presentation graphics.

Aesthetic quality relates to beauty, pleasant appearance. Several physical characteristics contribute to the aesthetic quality of a presentation graphic. Some of the more important aesthetic factors are resolution, line quality, shading (both color, hue and intensity), color range and texturing.

The range of resolutions is limited only by equipment available and the time we are

(Continued on SR/8)

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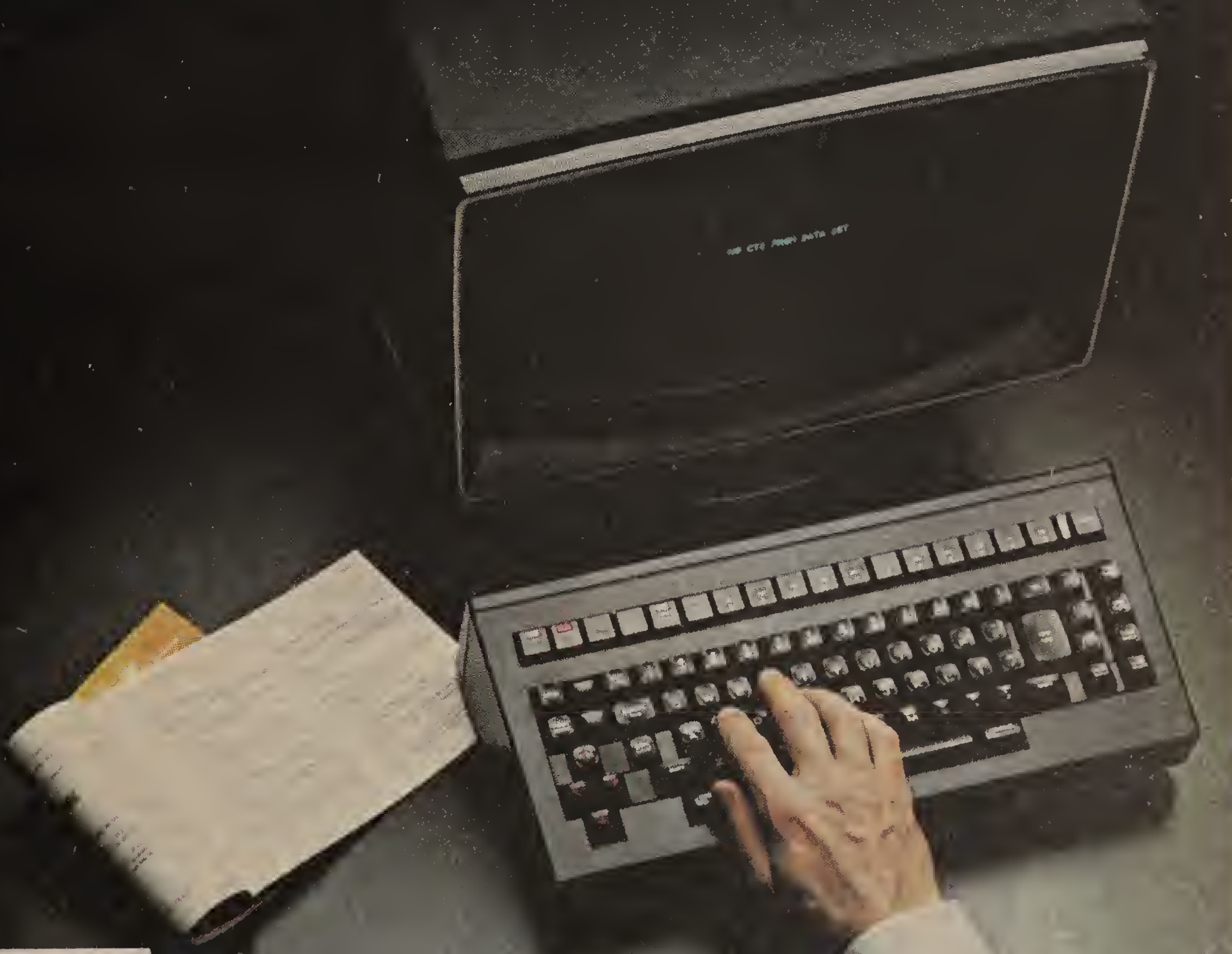

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Data Entry Especially Vital To Firm Whose Products Go To Over 32,000 Customers

Special to CW

STOCKTON, Calif. — Since 1965, King Bearing, Inc. has developed a distribution network that spans the four western states of Washington, Oregon, California and Arizona. This distribution network serves more than 32,000 customers with a diverse product line approaching 150,000 different items.

Products include a variety of industrial items such as bearings, belts, motors, hose and lubrication equipment.

The corporate accounting and DP offices, located here, accomplish all transaction processing for the company on a Sperry Univac 90/30 mainframe, which is being replaced by the more powerful Univac 1100/60 system this September.

King Bearing's data entry consists of 15 full-time and five part-time operators utilizing a Univac 1900 Computer-Assisted Data Entry (Cade) system consisting of a 96K-byte-central control unit, one disk drive, magnetic tape unit, printer and 10 keystations.

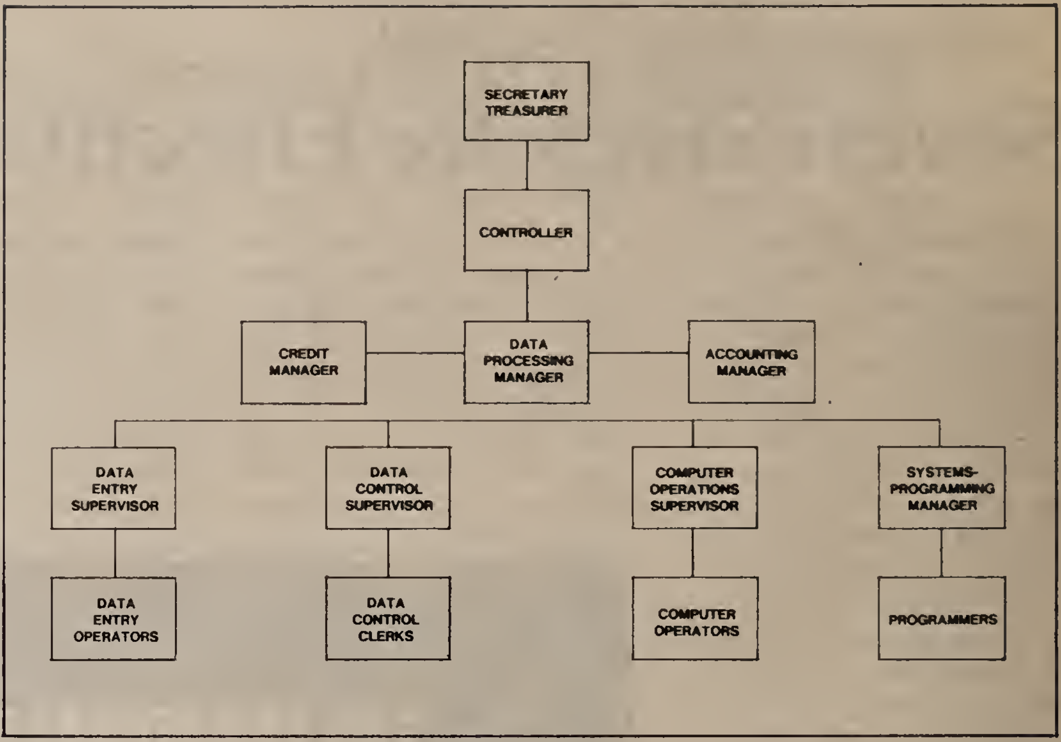
In order to process the large volume of work while holding the costs down, the data entry section utilizes part-time on-call staff. As the work load fluctuates during the month, the number of employees can be adjusted to the volume.

An efficiency reporting system was installed in June 1980 with the objective of improving productivity awareness in the section. A performance goal of 6.5 hours of active terminal time was established. The program compares actual keying time with the actual available keying hours, calculating an efficiency percentage.

Operators are not penalized for system downtime or other factors contributing to nonproductive time that is outside of their control. However, excessive use of sick leave will result in an adverse impact on the operator's performance calculation. The results of this approach have been very gratifying:

- An increase of approximately 40% in active terminal time was achieved.
- All experienced operators are exceeding the production rate of 14,000 keystrokes per hour; some have achieved rates of more than 20,000 strokes.
- All trainees are expected to meet or exceed a rate of 10,000 strokes per hour.
- At least two operator positions have been eliminated.
- A monthly plaque for the winner in each category (highest keystrokes and efficiency percentage) invites friendly competition and has resulted in acceptance by the data entry staff.

All Cade programs and documentation are maintained by the data entry supervisors. Operators are encouraged to contribute ideas for program improvement. Utilization of balancing procedures and employment of tables has resulted in a reduction of keystrokes required to produce the input tapes for the computer processing.



King Bearing's Distribution Net

An off-site storage facility houses all system tapes, source and compile copies and application documentation. Should a disaster occur, recovery time would be held to a minimum. Marilyn Kvidera, the data entry supervisor, stated, "I can't stress enough the importance of protecting the data entry section as well as the main computer."

Use of microfiche was stressed in a cost reduction project in 1978. A reports survey was conducted and potential candidates for conversion to microfiche were identified by the company's users. The use of microfiche has allowed King to distribute information to our branches, whereas before the cost was prohibitive, stated the DP Manager, Jerry Campbell.

$300,000 Savings

The accounts receivable open items report is distributed to all 49 branches at an annual savings estimated at $72,000 for this one application. King claimed it has achieved at least a $300,000 savings by applying the microfiche process to its inventory reporting system, accounts payable, accounts receivable and sales analysis systems.

Computer output tapes are generated off the company's mainframe and sent to a local computer service bureau in Stockton via taxi services. Programs and instructions are on file at the service bureau to allow custom titling, content references and number of sets desired. Tapes produced as late as 3 a.m. are generally returned by 9 a.m. the same day.

Some of the benefits achieved thus far:

- Significant cost savings.
- Reduction in file space requirements.
- Reduction in paper costs.
- Considerable reduction in report handling time.
- Availability of data to users.
- Cost avoidance in delivery expenses.

Other steps employed to reduce costs include using eight lines per inch for some of the hard-copy reports, reports audits, competitive bidding on forecasted annual forms requirements and vendor warehousing of computer forms by the vendor. Billing upon withdrawal from the warehouse allows us the volume discount while protecting cash flow and regional general manager approval for all special reports requests.

The results of these efforts have provided a great deal of satisfaction for DP personnel at this $120 million company.

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Voice Synthesis Explosion Near

(Continued from SR/4)

structions can be given instead of a simple alarm.

The major driving forces in speech recognition include the growing awareness of the possibilities of speech input resulting from growing exposure to speech output, as well as rapidly falling prices. Also, there certainly are some strides being made at the chip level. Deterrents to the recognition market are the cost requirements and the technological problems. Even the most expensive laboratory systems require controlled vocabularies, speakers and backgrounds. Affordable units have very limited vocabularies, require user and machine training and often do not neet the advertised accuracy.

Human factors are also a deterrent. The user training procedure is a nuisance and also requires users to speak in a grossly artificial way. For most thinkable applications, voice input (with present-day capabilities) does not compete well with accepted and successful alternatives to data entry (the keyboard and the OCR reader).

It is clear that there is a great amount of effort going into the development of devices, products and systems for voice synthesis and recognition.

While the market for both will be substantial by 1985, even greater growth will occur in the 1985-1990 time frame.

This is the executive summary from "Voice Input/Output: Markets, Technologies & Applications." The full report is available for $950 from Strategic, Inc., Suite 215, 4320 Stevens Creek Blvd., San Jose, Calif. 95129.

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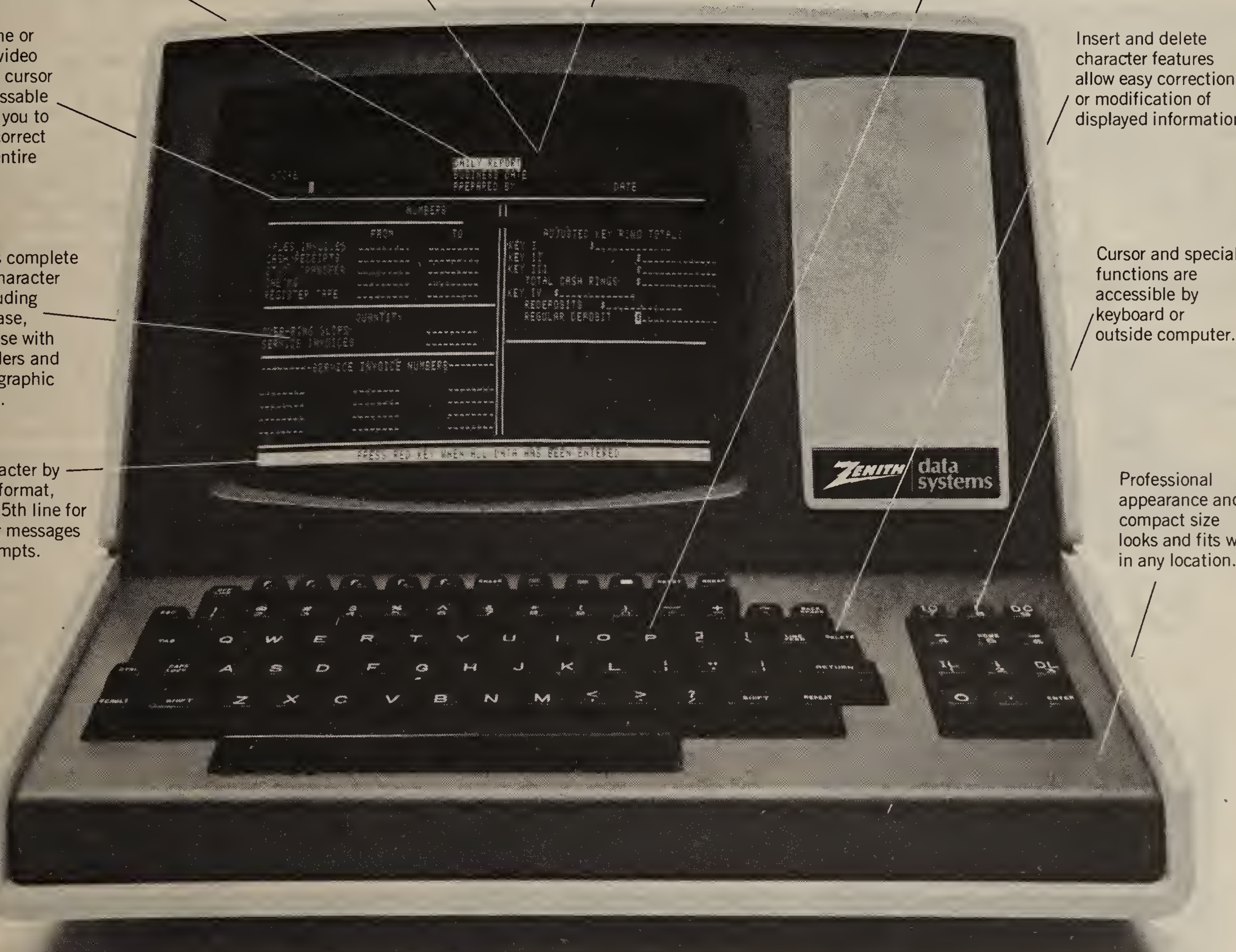

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CW 0831

Seven Steps for Effective Graphics Presentation

(Continued from SR/5)

willing to spend creating an image. It is entirely appropriate to use a presentation graphics that has only 640 by 480 picture elements in the horizontal and vertical axes for some applications.

Graphics artists would probably be appalled by this low resolution, since they have at their disposal high number halftone screens and photo reduction equipment. Some presentations may use this low resolution and still achieve good transparency.

Line quality is a measure of the smoothness of lines and the sharpness of line edges. It is dependent on resolution, but at a given resolution may be improved with higher addressability. That is, a line drawn with a raster display that has a .010 spot will be stepped or jagged with 640 by 480 picture elements.

The same line will look smoother if the addressability of the screen is increased to 1,280 by 960. A stroke-written line drawn with a good x-y digital plotter will be very smooth and exhibit very few jaggies. The same is true for stroked displays (calligraphic, beam wigglers).

To create shading on graphics we must have gray scale rendition. This is accomplished by intensity modulation of a light source or by halftoning or modulating the size of the image-creating dots. Graphics artists have used this technique for years in the printing industry.

Color range is achieved by using the gray scale capability with the primary colors. The color range available in a red, green, blue primary system is at most eight colors, including black. If a system has three levels of gray for each primary color, it will provide 27 different colors, including black. This color range is very adequate for most presentation graphics. Selecting a particular color that is not included in the palette is, to say the least, difficult. A limited palette constrains artistic flexibility.

Texturing provides an added dimension to make a graphics more realistic and allow some subtle effects to be portrayed. Certain software techniques have been employed to enhance some images with texturing. This facility has resulted in striking effects that contribute to image realism and accuracy.

A wide variety of devices exist as the medium to produce optimum presentation graphics and achieve maximum transparency. Selections include 35mm slides, foils or overhead transparencies, paper, animation (movies), videotape/disk, projection displays and mechanical plotters.

Equipment and Technology

One example of computer technology is computer generated presentation graphics, which offers us the benefit of man-machine interactivity. This allows the artistic creativity of the operator to be used to develop a cost-effective presentation graphics. Diligent use of this interactivity will yield maximum effectiveness and transparency of the resulting visual aids.

I am sure you have all heard technologists say "The Cathode Ray tube is dead . . . panels are here!" Well, I will bet that most of you are still using CRT displays and will be for several years to come. Equipment for making 35mm slides is now within the reach of all of us, even if we must use the local drugstore to process the film. I think that the 35mm slide is with us to stay.

As we move to more and better (less expensive) satellite data communications, the use of on-line (pre-prepared) computer graphics presentation aids will increase. We will be using soft graphics and reserve the hard copy for printed reports and the all encompassing personal file.

Videodisk will be a strong area for mass production of training aids, sales presentations and other areas where the cost of mastering can be amortized economically. Here, the aesthetic quality can also be increased to high-resolution, high-fidelity color slides because we do not have to use the limited NTSC broadcast channel bandwidth.

Displays to reproduce the graphics are coming along with higher resolution shadow-mast CRTs and laser displays.

In the future, new technologies will emerge and will be less costly. Computer-generated graphics presentation aids will then become more available for more applications. Presentation graphics that are right for each application can be developed with proper selection of media and equipment.

Applications requiring superior quality can be served in a more cost-effective way while most of us will have personal presentation-aids systems.

Biggs is manager of Hard Copy Engineering for the Information Display division of Tektronix, Inc.

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According to Survey

Distributed Data Seen Changing Data Entry

Special to CW

NEW YORK — With the advent of the distributed data concept made feasible by minicomputers and microcomputers, the relationship between man and his DP machine is being redefined and the makeup of the computer industry itself is becoming altered.

So said a recently released, two-volume study on distributed data entry by Frost & Sullivan, Inc. (F&S). That concept (distributed data entry) by 1984 will mature "as a viable information systems approach," added Joseph Savino, F&S study director.

In more earthy business terms, the turn to distributed data entry — which may or may not be associated with distributed data processing — will give rise to a $28 billion cumulative market during the 1980 decade.

Nearly 85% of this market will be accounted for by shipments of intelligent terminals, alphanumeric displays, factory data collection systems and key-to-disk equipment.

Data Entry Costs

Indeed, two-thirds of the respondents to an F&S survey plan to incorporate distributed data processing functions as well. Already, data entry costs range between 10% and 25% of a DP budget, these users report.

Such users, it should be noted, welcome mixed vendor systems to achieve their goals. They seek data entry products that are aggressively priced, reliable, maintenance free, compatible and user friendly.

The last item is especially important, F&S said. Users crave systems that can guide "less skilled data entry personnel," thus effectively shortening their training periods. "This is one of the user's unwaivering requirements," F&S said.

As to hardware characteristics, users are keyboard-oriented, with function menus and programmable keys offering significant appeal. Intelligent terminals interfaced with key-to-disk systems are viewed as a means to reduce communications costs. And alphanumeric displays are proving to be indispensable, as on-line data entry is implemented in distributed environments.

In addition, optical readers are described as beginning to realize their full potential value. And portable data recorders will be used increasingly to capture source data in remote data entry applications, that is utility meter reading, survey recording, time keeping and inventory control.

Maintaining only a central data base, although preferred by a majority of users, is also giving way — in a significant number of cases — to remotely located data base organizations, F&S noted. But the big focus in the 1980s will be on software-intensive products. For example, the demand for applications software is gaining momentum, F&S said. Some big new applications include manufacturing (plant floor) functions, accounting and office automation.

Further information is available from Customer Service, Frost & Sullivan, Inc., 106 Fulton St., New York, N.Y. 10038.

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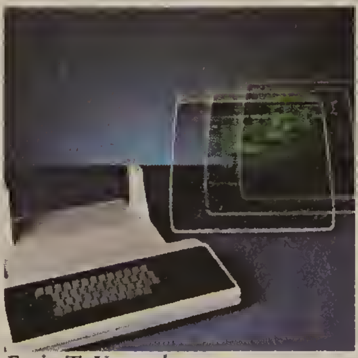

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Space is always at a premium, be it on a desktop or an entire office work area. Which is why Memorex made the 2078 both compact and versatile. The whole package measures just 17" wide by 19" high by 24" deep. And it weighs a mere 55 pounds. A detachable keyboard, and a removable monitor that can be conveniently placed on a shelf, further increase workspace efficiency.

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It can be ordered with your choice of five screen capacities, from 960 to 3564 characters. With five keyboards, including 75-key EBCDIC typewriter, ASCII typewriter and EBCDIC data entry as well as 87-key ASCII typewriter and EBCDIC typewriter with numeric pad. And an impressive list of options, including selector light pen, security keylock, an unprotected field indicator and a special conditions alarm.

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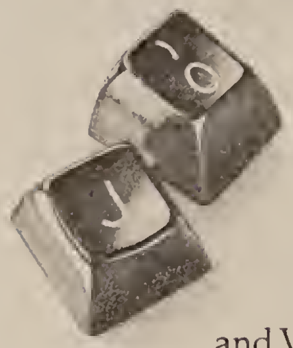

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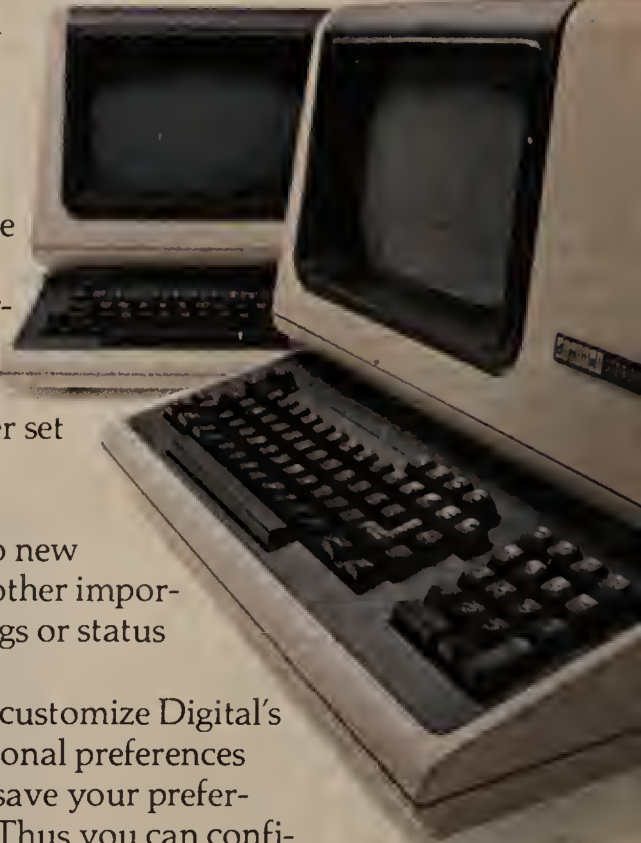

Crisp, well-defined characters are easy on the eyes. And to make it easier to isolate information, lines can be made larger and characters can be reversed, brightened, underlined, or even made to blink. A line drawing character set makes video forms look like the printed forms you're used to.

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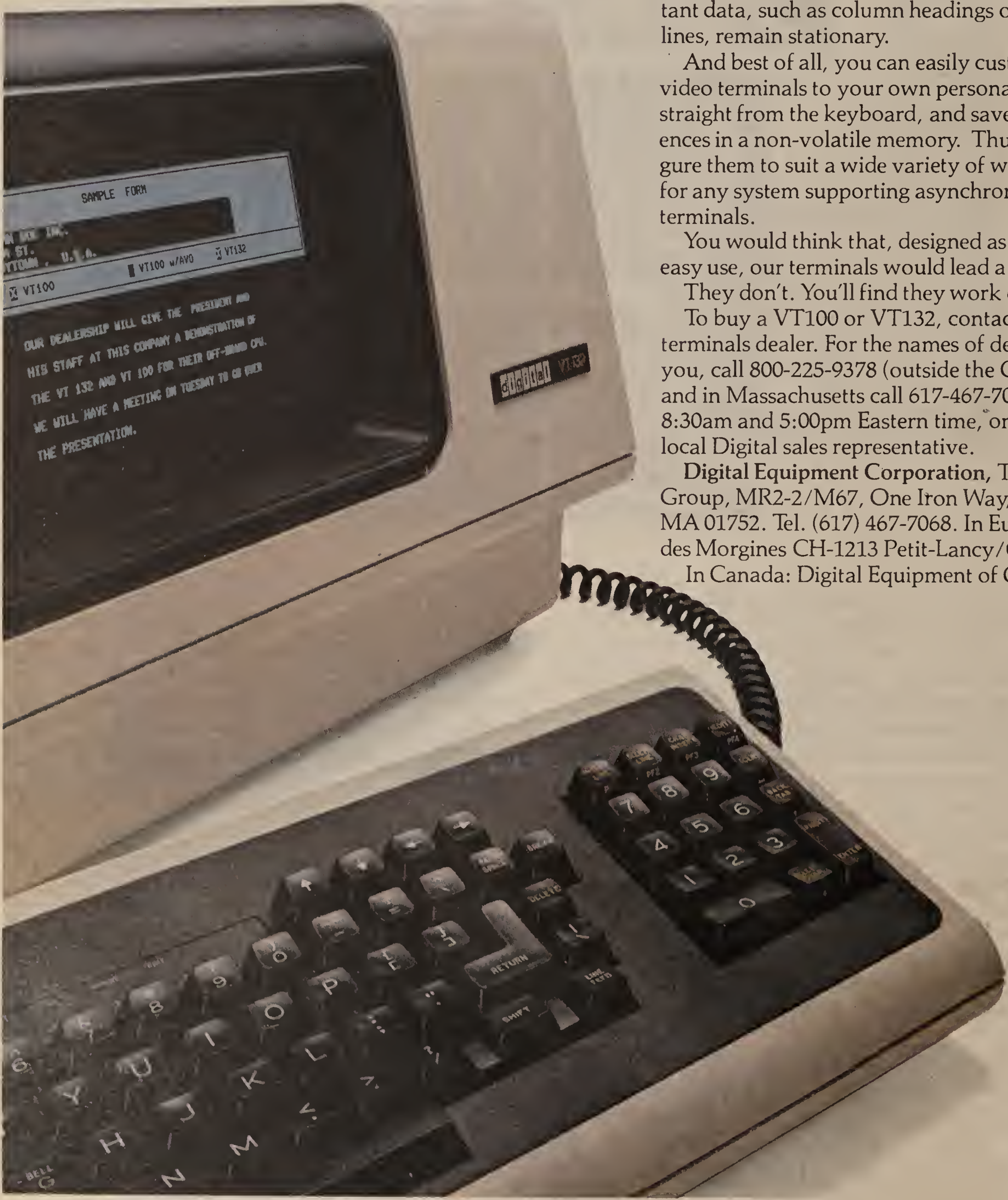

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GE Unit Installs COM, Saves 3,400 Graphics Hours

Special to CW

SALEM, Va. — A savings of more than 3,400 hours per year in computerized interactive graphics system time is resulting from the use of computer output microfilm (COM) in place of an electrostatic printer/plotter to generate automated engineering drawings at General Electric Co.'s (GE) Drive Systems Department here.

Paying for itself in less than two years, in terms of time saved, the in-house COM system is also being used to achieve faster turnaround at less cost for business systems applications that previously were handled by an outside service bureau.

Manufacturing drive systems and controls for electrical power generation, oil well drilling, metal rolling, paper milling and other applications, the General Electric Drive Systems Department uses engineering automation to produce B-size (11 in. by 17 in.) electrical elementary and wiring drawings for customers.

When customer orders for drive systems and controls are received, department engineers fill out edit sheets with customer specifications. Sheet data is entered in one of three different computers that logically build command files and produce tapes for generating drawings.

The tapes are then entered in one of three computerized interactive graphics systems that execute command files and display drawings on screens. Using display screens, operators complete drawings by modifying them to include special customer requirements.

Previously, after drawings were completed, they were plotted on an electrostatic printer-plotter operated on-line with the computerized interactive graphics systems. Drawing revisions were also handled in the same way.

However, printer-plotter operation was slow, taking an average of 3⅓ minutes per drawing, during which time on-line interactive graphics systems were tied up. With continuing growth in automated drawing volume, GE began looking for a way to speed up drawing output without requiring additional system capabilities.

COM Solution

Following a comprehensive survey, the decision was made to use COM as a solution to the problem. The Drive Systems Department chose a 3M System 710 for the task..

"The system 710 provides the resolution required for B-size drawings at low cost," according to Robert O. Harper, senior systems engineer. "It also provides a capability for reading many types of tapes, which is important since we use a variety of different tape densities and formats.

"In addition, it has a universal camera capable of running film ranging from 16mm to 105mm in size, making it possible to handle business systems as well as graphics output.

"Use of the COM system in place of the printer-plotter reduces the average time our interactive graphics systems are tied up in outputting automated drawings to two-thirds minutes. This saves us about two and two-thirds minutes per drawing," Harper pointed out.

"The interactive graphics systems are used now only to write a tape for off-line drawing production on the COM system, rather than generate drawings while operating on-line with the printer-plotter.

"With an annual production volume of 35,000 original automated

(Continued on SR/12)

This COM system replaced an electrostatic printer/plotter.

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In-House COM Graphics Cuts System Uptime

(Continued from SR/11)

drawings, plus revisions of each original, savings in interactive graphics system time amounted to more than 3,400 hours per year after the COM system was installed," Harper explained.

"This resulted in a cost reduction that paid for the COM system in less than two years. Since then drafting for additional products has been automated, increasing COM volume to 78,000 originals per year, resulting in even greater cost savings.

"Operation of the COM system has thus delayed the need for an additional interactive graphics system" he said. "At the same time, it has freed existing systems for more creative work.

"In addition, the COM system enabled us to speed up turnaround and reduce costs in printing business records on microfiche," he added. "For example, we are now able to achieve same-day service on a normal basis and half-hour service on 'specials' by in-house rather than farm out of microfiche."

The 3M 710 system at General Electric Drive Systems Department has a new generation command console and dual hard-disk storage. The basic component of the command console is an LA 36 Decwriter keyboard printing terminal that has a transfer rate of 30 char./sec.

The system's dual disk file provides rapid-access bulk memory to store and recall system and job parameters, set-ups and special routines in fractions of a second. Eliminating the need for tape reel loading, the file has an average access time of 10 msec and provides storage capacity of more than 1,600,000 12-bit words per disk.

The COM dual disk file is used to store a standard drawing program and 20 variations of B-size forms for engineering automation applications. The file also holds 100 different programs for business information applications.

Storing automated drawing forms in the COM dual disk file reduces the need for forms storage in the data base of interactive graphics systems.

The System 710 has cut by 2⅔ minutes the time that interactive graphics systems are tied up in outputting automated drawings.

Previously, forms were individually stored with each drawing in the data base. Now, only one copy of each form is stored, freeing disk space in the data base for more useful data.

A special interface program is used to create a file that is output on tape for COM operations. The program rotates vertical and horizontal drawings to a common orientation to facilitate standardized reproduction. Depending on the amount of alphanumeric data, it takes 16 sec to 45 sec to generate automated drawings on the COM system. Overall, use of the COM system shortens cycle time between creation of drawings in interactive graphics systems and delivery of final drawings.

Production of automated drawings on the COM system ranges from 4,000 to 7,000/mo. Tapes containing one to 1,000 drawings are produced on interactive graphics systems and mounted on the COM system. Based on a modifier that is part of each drawing number, the proper form for each drawing is called out of COM dual disk storage and plotted on film.

Operating unattended, the COM system generates drawings on 35mm film that is processed in-house and mounted in aperture cards. The cards are prepunched and interpreted by an IBM 129 card data recorder operated as an attachment to the COM system and driven by a separate tape produced by interactive graphics systems.

Reproducible blowbacks are made from cards retained in file. The reproducibles are returned to the systems engineer where revisions, if any, are made as customer orders are processed. Following completion of orders, revisions are entered in interactive graphics systems, tapes are generated and new aperture cards are produced. Cards or reproducible blowbacks, as desired, are then shipped to customers with finished drive systems and controls. Drive Systems Department is obligated to provide a large volume of documentation with each system sold.

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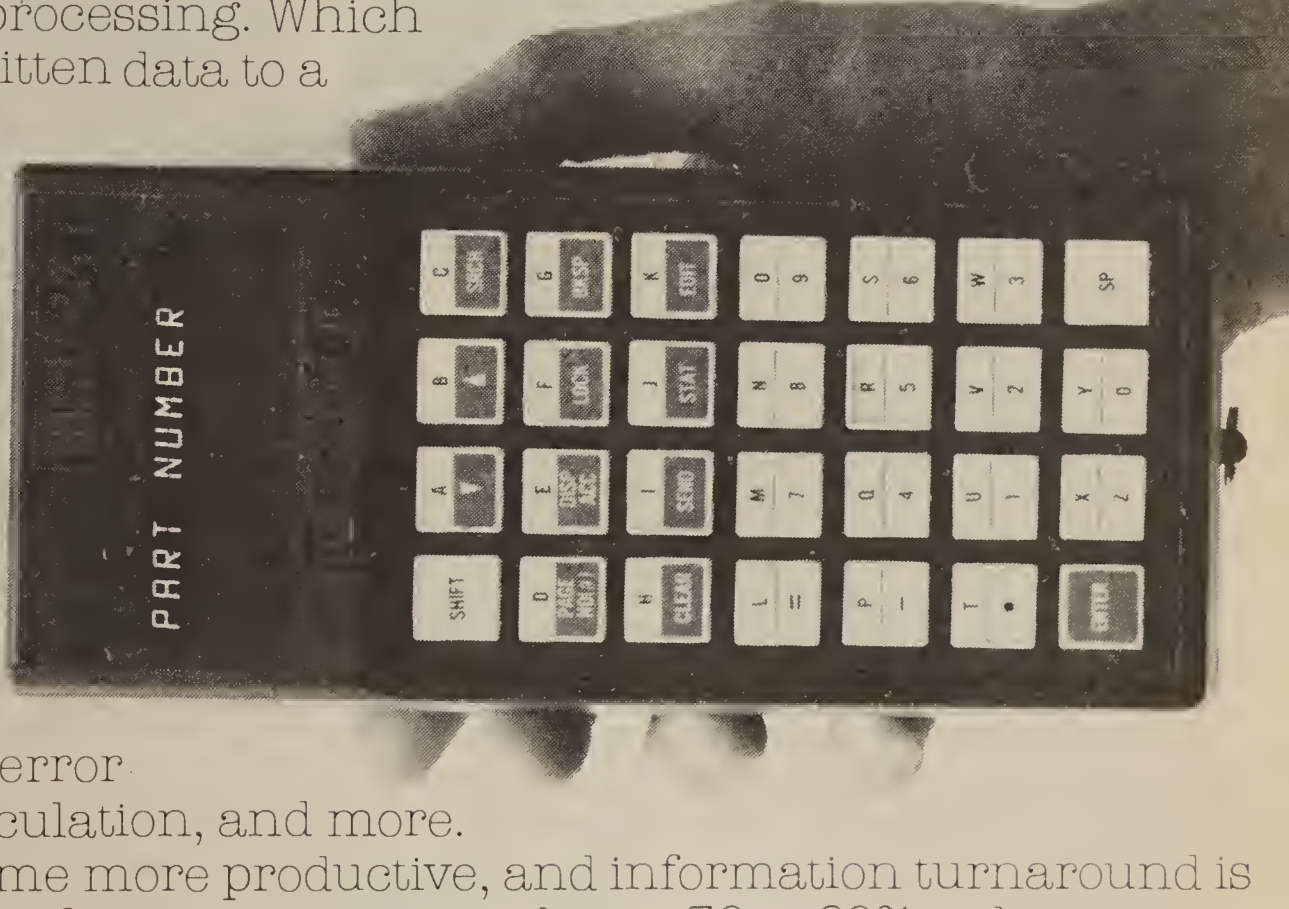

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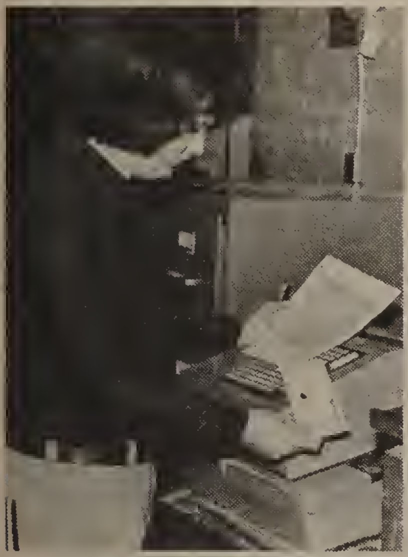
Textile Maker Counts Profits With SRP Units

Special to CW

DANVILLE, Va. — A textile manufacturer here has received major benefits in its greige cloth inventory operations from a new data collection system.

In monitoring its production as well as tracking movement of its greige cloth (woven or knit fabric that has not been finished), the Danville Group of Dan River, Inc. noticed discrepancies in recorded weights and lengths at any given period of the product's storage. And because much of the information entered by various departments was handwritten, accuracy was also a problem.



Roll of greige cloth is weighed at inspection station.

With advice from the Standard Register Co., Dan River decided to install a system using Source Record Punch (SRP) data collection units and Zipcard forms to improve discipline and control by producing computer-ready input documents and daily computer-prepared reports on inventory.

Once the greige cloth comes off the looms in lengths it is sewn together and moved to Inspection for a weight check, which has to conform to a standard weight-per-year of cloth, as well as match patterns against the master-style cards on file.

Previously, this information was recorded by hand on a hang tag, which had a preprinted identification number and was attached to the roll. The roll then moved to Finishing where a card was written up to indicate its bin location.

Information concerning production came to DP from Inspection, advising what cloth had been sent to storage, using the tag numbers as a control.

"Two problems became uppermost — we had no way to be sure that Inspection had actually checked a roll and, while Inspection reported what it had sent to Finishing, we had no reports from Finishing as to what had been received," noted A. Don Fleck, former director of Management Information Services.

However, once the SRP units had been installed in both Inspection and Finishing, data gathering became automatic; each department has a master file of tab cards prepunched with data concerning specific product information.

When a roll arrives at Inspection, the style card is pulled and information is transferred to the Zipcard form through the SRP unit, appearing in both machine-readable and man-readable form. DP receives a copy of each form for entry into the computer reports.

Similar entry of information occurs at Finishing, where the rolls are then directed to Finishing and shipping, or to storage lots for later use. Since rolls are assigned to lots by age, the oldest rolls are guaranteed to be used first.

By having as much information entered by machine as possible Dan River is able to monitor product movement and assure that the cloth was inspected and matched against the correct swatch, through computer reports.

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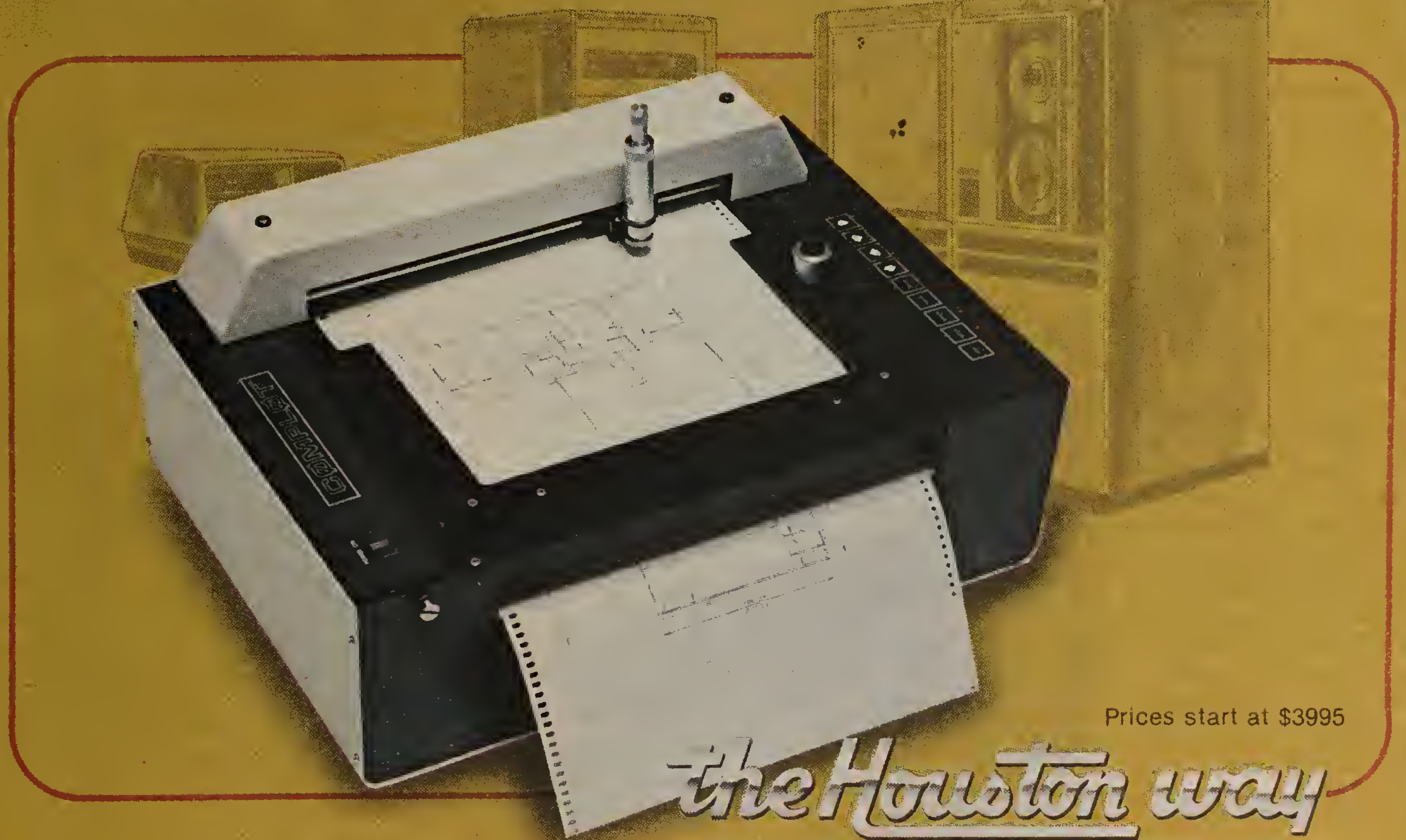

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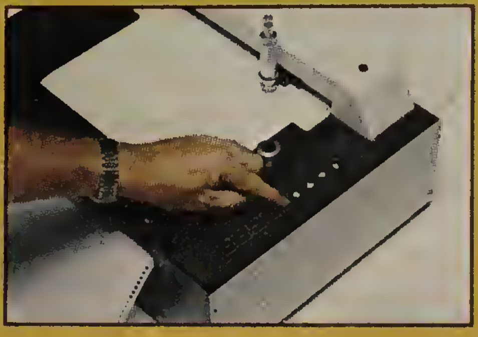

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New Generation of Dot Matrix Printers Poised

By **Ken Mathews**
Special to CW

With improved print quality, a new generation of dot matrix printers is poised to provide stiff competition for daisywheel printers in 1982.

Although this technology began developing about two years ago, competition is heating up now because many more dot matrix printer manufacturers already are or will be producing correspondence-quality units next year. Among these are Anadex, Inc., Amperex Electronic Corp., Malibu Electronics Corp. and Sanders Technology, Inc.

This new generation of dot matrix printers evolved because of technological advances that allow dots to be placed more closely to each other than previously possible.

This overcomes the "dotted" look of the older generation of dot matrix printers that is adequate for general data processing printout, but not even close to the print quality available with daisywheel printers.

As a result of this new technology, the correspondence-quality dot matrix printer will assume many of the applications now performed by the daisywheel. The major application is text processing and there are many others where readability better than the conventional dot matrix printer is desirable.

Two Advantages

The correspondence-quality dot matrix printer offers two significant advantages over the daisywheel. First, the dot matrix printer is inherently faster than the daisywheel because it prints "on the fly," whereas the daisywheel has to be stopped momentarily to print.

Second, the dot matrix printer can produce relatively high-quality graphics.

Comparing the two types of printers, the daisywheel is limited to less than 70 char./sec, whereas the correspondence-quality dot matrix can achieve more than 150 char./sec. Although their list prices may be about the same, the dot matrix provides more characters per second, per dollar.

The ability for the dot matrix printer to print high-quality graphics is related to its ability to place dots anywhere within a specific grid. Large, small, wide, narrow and bold characters can be produced by merely a change of software. With the daisywheel printer, it is necessary to change the daisywheel to change fonts.

The daisywheel printer can also provide graphics, but this is done by activating a single dot at a time . . . a very slow process with an already slow machine. In contrast, a correspondence-quality dot matrix printer can print at least nine dots at a time, providing even faster throughput with a faster machine.

The basic concept for correspondence-quality dot matrix printing involves the formation of characters by the impact of print needles on an inked ribbon and paper.

The print needles are contained in a print head that is controlled by electronic circuitry within the printer. The number of needles and their spacing determines the aesthetic quality of printing.

Either of two techniques, or combinations of both, can be employed in obtaining correspondence-quality printing. In one approach, a single pass is used; in another, the print head makes multiple passes to produce characters.

One single-pass method employs two rows of nine needles that are offset from each other so that 18 overlapping dots may be printed one above the other. In producing a character, the print head moves at a constant rate horizontally across the paper and the needles are programmed to generate the ap-

To Provide Competition for Daisywheels

propriate dot patterns foreach character.

In the multiple-pass approach, a single vertical row of needles is used. With a nine-needle print head, up to nine dots are printed in the first pass, the paper is moved vertically a small amount, then another pass adds another vertical row of nine dots displaced slightly from those of the first pass. Multiple passes are employed to obtain overlapping dots in the desired patterns. Using two passes per character can give a character appearance that is similar to that of the 18-needle single-pass print head.

The single-pass, 18-needle print head has the advantage of a faster character throughout than the multiple-pass, nine-needle print head.

Also, since the printing load in the 18-needle print head is shared almost equally between the two groups of nine needles, actual mechanical wear is less than that of the multiple-pass nine-needle print head.

> *'The correspondence-quality dot matrix printer will assume many of the applications now performed by the daisywheel. The major application is text processing and there are many others where readability better than the conventional dot matrix printer is desirable.'*

Problem Technique

One problem with the multiple-pass approach is the difficulty in obtaining good registration between dots printed from pass-to-pass. This technique requires carefully controlled paper movement during the incremental shifts from one pass to the next.

Compared to the single-pass printer, the multiple-pass type requires tighter mechanical tolerances in the print head drive system and these tolerances must be maintained over the life of the printer.

The important design considerations for the single-pass dot-matrix printer are related to the print head. It must be manufactured to tighter tolerances than a print head with only a single row of nine needles.

Also, the electromagnetic circuit that is employed to actuate the print needles must provide sufficient energy to produce clean printing, but at the same time must not consume excessive power that could cause heating problems.

Printer Examples

An example of a correspondence-quality printer is the Anadex, Inc. WP-6000. It operates in either of two modes, a correspondence-quality mode that is capable of 150 char./sec or a noncorrespondence-quality mode that will work at speeds of more than 300 char./sec. It offers a variety of U.S. and foreign fonts, with or without proportional spacing.

The WP-6000 employs an 18-needle dot matrix print head consisting of two rows of nine needles that are offset from each other in the vertical dimension. This allows overlapping dots to be printed vertically, in a single pass, with the dots appearing as a continuous line.

Graphics capability is also available with up to 144 dot/in. resolution in both the vertical and horizontal axes. Paper may be tractor-fed or friction-fed, or an automatic sheet paper feeder can be used. It provides bidirectional logic-seeking operation and can operate with RS-232, parallel or current loop interfaces.

Another correspondence-quality dual mode printer is

(Continued on SR/18)

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Dot Matrix Printers to Challenge Daisywheels

(Continued from SR/17)

the Amperex Electronic Corp. GP 300. In the correspondence-quality mode it provides 80 char./sec and in the DP mode the speed is 300 char./sec. This single-pass printer uses an 18-needle, two offset-row of nine needles each.

Among the available fonts in the correspondence-quality mode are gothic, courier, optical character recognition (OCR)-A and OCR-B and italic. It can operate with an automatic sheet paper feeder, tractor or friction feed. Bidirectional, logic-seeking operation is employed. Available interfaces include RS-232 and parallel (Centronics Data Computer Corp.). Both of these two correspondence-quality printers employ microprocessor control and firmware-controlled fonts.

The first multiple-pass, dot matrix printer was the Model 12/7 from Sanders Technology. Speed of the 12/7 is determined by the character size and the number of passes that are made. Operating at a 12 in./sec rate, the printer can produce 144 char./sec in a single-pass, DP mode. For correspondence-quality printing, four passes are required and the seven-needle head achieves a 36 char./sec speed.

Programmable read-only memory (Prom)-controlled fonts include 10- or 20-pitch characters in courier, Helvesan, OCR-A and OCR-B, and italic. Up to 1,000 dot/in. can be produced using 64 passes of the print head in the graphics mode. Bidirectional logic-seeking operation is provided. Centronics, parallel and RS-232 interfaces are provided.

The Malibu Electronics Dual-Mode 200 is another example of a multiple-pass printer. Two passes are used in the correspondence-quality mode; speeds range from 42- to 70 char./sec.

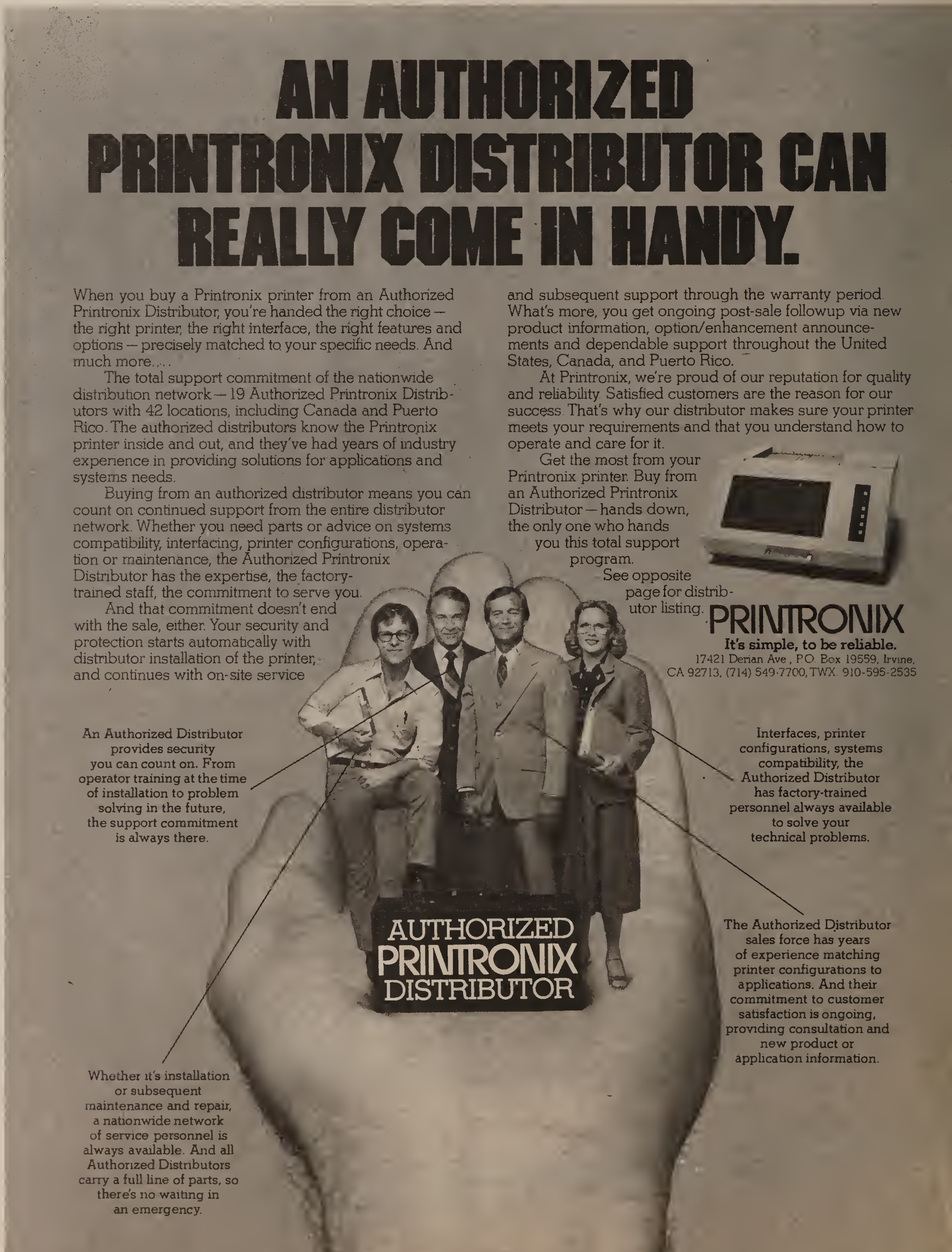
Titan 10-pitch is the standard font and there are a number of optional fonts that include elite 12-pitch, italic, OCR-A and scientific and foreign character sets. Up to 12 character fonts may be stored and interchanged while printing. Characters are generated by a nine-needle print head.

In the DP mode, the Dual-Mode 200 can operate at speeds from 165- to 250 char./sec. Tractor and friction feed are standard. The graphics mode allows a 120-by-144 dot/in. resolution. Both RS-232 and Centronics (parallel) interfaces are provided and the printer is plug-compatible with existing daisywheel printers such as those from Diablo Systems, Inc. and Qume Corp.

This new generation of correspondence-quality dot matrix printers signals a future trend in communications. Using the graphics mode, these printers will produce the company logo and a personal signature on the letterhead. In the correspondence-quality mode, the text of the letter will be printed. You cannot get the same combination of functions with a daisywheel printer.

Mathews is vice-president of marketing at Anadex, Inc.

'I Didn't Notice the Fine Print That Said "Cabinet Optional." '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Has Mini Advantages

High-Speed Printer Closes Gap Between Floors

Special to CW

NEW YORK — Putting a high-speed printer where it is most needed can save hundreds of man-hours and improve the productivity of computer operators and programmers, according to Stanley Rose, systems officer of Bankers Trust Co., New York City.

"We knew that a lot of time could be saved in getting our printouts, such as program listings, from our data center to the program development team, located seven floors away, and user reports to the operations area, located 22 floors away from the data center," Rose explained.

Information that the program development team needed was hand-carried from floor to floor between 7 a.m. and into the evening each workday.

"Our first remote printers were in the operations area and used long-line parallel interfaces to allow us to put our 300 line/min printers there. This was unsatisfactory for several reasons. Long-line parallel interfacing required expensive wiring, differential drivers and receivers and specialized controllers. Also, the 25 wire cables took up too much of the limited floor-to-floor conduit space.

"In addition, long-line interfacing made it difficult for us to switch a line printer from one mini to another; yet we needed the ability to go immediately to our backup system," Rose said. "With serial interfacing, a simple patchcord moves the printer from one computer to another."

Continued Search

A continued search for solutions led Bankers Trust to a serial interface for high-speed printer systems developed by Southern Systems, Inc. An emphasis on the technology of printer interfacing led Southern Systems to development of serial interfacing for high-speed printers.

"Most peripheral specialists felt that serial interfacing for a high-speed printer represented a waste of computing power. They didn't take into account the increased capacities of computers and the changing needs of users.

"For Southern Systems, the growing needs in data communications seemed to dictate the necessity for this interfacing," according to James W. Rule, vice-president of marketing for Southern Systems.

Bankers Trust now operates 18 line printers with serial interfacing, 10 located in the development area 200 ft away, and eight located in the operations area 500 ft from the minicomputers in the data center. Speeds are 300 line/min and 600 line/min.

Minicomputers operating with the serial interfaced printers are Digital Equipment Corp. PDP-11/70 and VAX-11/780.

"Serial interfacing gave us back the advantages of the minicomputer — advantages we'd had to forfeit due to the relative placement of data processing functions within the building. Before serially interfacing these printers, programmers had to wait hours for their listings," Rose said.

Greater reliability also resulted from the serial interfacing since the parallel crossover switches have been eliminated.

The space savings between floors was one of the biggest advantages. "Data processing and data communications have undergone a lot of changes since our building was constructed about five years ago. Our conduits for data communication linkups were rapidly filling up," Rose said.

"We've found that the space-saving aspect is more important than ever to our printer system customers," Rule added.

"When long-line parallel interfacing requires 25 or more wires and the serial can be accommodated — even function more reliably — with two, three or four wires, there is a big space-saving factor."

Rule added that many customers are opting to add modems and operate the printers serially via telephone lines.

Since the development of serial interfacing for printers functioning with minicomputers, Southern Systems has developed the capacity to serially interface for the synchronous protocols of the larger mainframes, such as IBM and Burroughs Corp.

Following are Distributor headquarters and their telephone numbers. Forty-two offices exist around the U.S., Canada and Puerto Rico to serve your printer needs. For the office nearest you, check with your distributor.

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Texas-Based Insurer Nears Goal Of Productive Paperless Office

Special to CW

FORT WORTH, Texas — Paper flow is dwindling to a trickle at Equitable General Insurance Co. As paperwork shrinks, operating efficiency increases, personnel productivity rises and customer and agent service grows better than ever.

Texas-based Equitable General has been moving steadily toward a goal of paperless insurance operations. The latest step is a computerized Front-End Entry (FEE) system. The FEE puts operations at headquarters here on-line up front where the insurance applications come in and the paper buildup ordinarily begins.

"With the new front-end system, we choke off paper buildup before it can start," according to Virgil Pittman, senior vice-president for corporate information services. "New business applications are entered immediately to computer files, then information needed to underwrite risks and process policies is channeled to the various workstations via online display terminals under electronic traffic control.

"Underwriting is done from terminal screens, and no paper is generated between the initial application and the printed policy. Processing is swift, sure and under tight control every step of the way," Pittman declared.

Equitable General's drive toward paperless operations started in 1975 after the Equitable Life Assurance Society of the U.S. purchased Houston General Insurance Co., a property and casualty insurer. The purpose of the purchase was to give Equitable's 9,000 life agents a vehicle to market automobile, home owner and related personal lines.

Basic Objective

A basic objective from the beginning was to keep the Equitable agent "in on the sale and out of the service." This demanded better systems to exclusively and effectively handle claims, inquiries, policy changes and other policy service functions, leaving the agent free to sell. In developing the needed systems, the company adopted its on-line, paperless approach. Today, Equitable General is a $200 million firm with 200,000 policies in force and aiming for a lot more growth.

The FEE system, on-line since early 1980, now handles all new business applications for property and casualty insurance. FEE runs on an IBM 3033, which is the host system for all on-line computer applications. Currently, some 2,700 Equitable agents in 27 states are selling property and casualty business. New policies processed on the system are averaging more than 6,000 a month.

Some 140 on-line terminals (IBM 3278s) are involved in the processing, which is pa-

(Continued on SR/20)

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Texas Insurer Nears Goal of Paperless Office

(Continued from SR/19)

perless from start to finish. Applications are routed from the mail room to policy control. Here, the terminals are used to access a client data base prior to computer assignment of a policy number and a client number.

Premium payment checks are separated from applications and check amounts are entered into a data base. Applications go to a data entry section where terminal operators follow a series of guide screens to enter complete application data. Data entered is set up on the on-line computer file as a series of screens similar to the application itself. The record includes any notes or comments from the agent initiating the application and also includes agent and client telephone numbers. At this point, the application is microfiched and the paper itself is discarded.

The application record, now a series of display screens, is routed by the system to a queue or electronic storage bin. Each queue is designated to a particular administrative underwriter area and is routed to a home owner or auto insurance specialist in the appropriate administrative underwriter section. This is accomplished under the control of the terminal traffic management system developed by Equitable General.

Administrative underwriters call up the screen displays for the applications on the queue on a first-in, first-up basis, although urgent priority applications automatically go to the top of the queue. The underwriter reviews and underwrites the application from the screen display.

If the application is complete and meets all underwriting criteria, the underwriter will approve it, enter the necessary codes and transmit the approved and underwritten application record to a policy issue data base.

If the application poses underwriting questions, it is routed to a technical underwriter for a critical review. The technical underwriter, guided by decision questions input to the application record by the administative underwriter, will evaluate and either underwrite or reject.

Should the administrative underwriter find that the application he is reviewing is incomplete or needs additional information, he enters pertinent notes and comments to the screen record and sends the application to the electronic queue at the Customer Service Center. Terminal operators here call up the application screen display, then get on the telephone to the agent and/or the client to obtain the needed information.

Speedy Process

This is usually a speedy process as the switchboard at the Customer Service Center accommodates dozens of outgoing and incoming national and Texas lines. To further expedite matters, the computer sets up the questioned application queue in priority sequence and within time zones around the country.

Should the Customer Service operative encounter a delay in contacting the agent or client, or if a call-back promise is made, an appropriate note is added.

When the information required to complete an application is obtained, the application record is routed back to the administrative underwriter queue.

The underwriter makes a final check and sends the application to the policy issue area. Once the policy is issued, the data screens are removed from the FEE. Rejected applications are retained in the system for a time in case of later questions from the agent or the client.

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Viable Data Entry Alternative

OCR Proves Logical Choice for Tallying Proxies

Special to CW

FORT LEE, N.J. — "OCR [Optical Character Recognition] seemed a logical choice," Lester Sarter, senior vice-president of Bradford Securities Operation, Inc., said when he began exploring alternatives to the company's data entry requirements.

Sarter is in charge of DP and financial operations at Bradford Securities, one of the largest securities records keeper and processor in the stock transfer industry.

One of their primary services is the tabulation of proxies. Every company listed on the Stock Exchange is required to hold an annual meeting and vote at least once a year.

"Most of our clients," Sarter explained, "hold their meetings in the same time frame during March and April."

During this period, better than two million proxies are mailed to shareholders. Return is approximately 60%, which means that more than 1.2 million proxies need to be tabulated over a 60-day time period, or a 40 to 45 work-day period.

Traditional Methods

Traditionally, there were one of two ways these proxies could be tabulated:

1. IBM cards were prepared for the proxy votes and mailed out. When the cards were returned, the results were keypunched.
2. Votes were physically batched with a header card according to the number of combinations. "For a proxy containing five propositions with a 'Yes' or 'No' choice, this could mean as many as 32 different combinations," Sarter said.

The processing of these proxies was time consuming and required hundreds of personnel. "In addition, because we were dealing within a short time frame, there was a lot of pressure to turn around the results in time for the annual meetings," Sarter explained.

To compound the situation, the Securities and Exchange Commission (SEC) began enforcing very stringent rules on corporations, which necessitated increases in the number of propositions and required each proposition to list "For," "Against," and "Abstain" choices. Given 10 propositions with a "For," "Against" and "Abstain" choice, there could be as many as 59,000 combinations to keypunch or batch.

Upon their decision to go with OCR, Bradford Securities had to develop a form that was varied enough to contain up to 42 propositions while meeting the requirements of their corporate clients.

Since many clients wanted to print their own forms, Bradford was faced with overcoming different variations in forms such as printing intensities and voting boxes that could be off as much as ½ in. In addition, marks were not always placed inside the box, but above, below or to the side of it.

Specifications were then developed based on such criteria as flexibility, throughput speed and accuracy. Various OCR vendors were contacted and initial tests conducted, according to Sarter.

"Because of the differences in forms and the way in which they were completed, flexibility became the most important factor. Only the Scan-Optics, Inc. system was able to compensate for these form variations while maintaining a 99% accuracy rate," he said.

"In addition, no one could touch their throughput speed of 9,000 documents an hour." Other reasons for choosing the Scan-Optics system included the scanning technology enabling more efficient capturing of information and the unique design of the transport system providing high productivity by allowing documents to be continually fed and unloaded, he said.

Careful evaluation of Bradford's requirements indicated the need for a Scanedit system, providing in addition to high-resolution video capture, concurrent operation of scanning, video data entry and key data entry.

Problems Eliminated

Today, there are periods when up to 70,000 documents a day are being processed. With the check-digit processing, front-end problems are eliminated by capturing errors in the beginning as documents are read.

"The results have been absolutely fantastic," Sarter said. "Pressure has been alleviated because the proxies are tabulated quickly and accurately. We estimate a savings of approximately $100,000 since we installed the system."

In addition, Bradford Securities' internal audit people have given the Scanedit system and the associated clerical involvement the highest rating in accuracy and control. They claim it is the "best system we've seen from a control point of view."

In fact, the results have been so good that many other corporations for which Bradford was not even processing have begun providing them with the necessary data to do the service as a stand-alone service.

Mortgage Banker to Trim Printing Costs, Improves Service, Communications

Special to CW

SOUTHFIELD, Mich. — One of the nation's largest mortgage bankers is taking an important step toward cutting its printing costs while improving both service and communications.

Advanced Mortgage Corp. will soon install a Honeywell, Inc. Page Printing System (PPS) to improve the production and quality of daily reports and numerous other forms that are circulated both inside and outside the company.

"The Honeywell system will give us a better printed product more quickly and allow our people to be more effective at their jobs," according to Ken Davidge, DP manager of Advance Mortgage. "This total effort translates into better control of our costs."

Tremendous Growth

Advance Mortgage has experienced tremendous growth over the last few years, and the firm's two conventional impact printers were not able to handle the increasing work load.

"At first we used a local computer service bureau to handle the major volume of our printing needs," Davidge said. "After awhile, we began to review the cost effectiveness and improved service we could achieve by bringing the work back in-house with a more sophisticated system."

Davidge and a management team spent more than six months investigating several of the computer printing systems available and concluded that the Honeywell system was best for their needs.

The PPS nonimpact printer operates electrostatically, using roll-fed dielectric paper. A liquid toner is then drawn and bonded to the electrostatic images on the paper.

The Advance Mortgage system reads from a magnetic computer tape and includes such features as a hole punch, a vertical perforator and an optical character reader font that allows mortgage payment slips printed on the machine to be read by another computer once they are returned with a payment.

"The printed copy itself is going to impress a lot of people around here," said Terry Early, data center manager, who was involved with the new system decision. "We have been running the five-part oversize computer forms for our internal reports. Now everyone will receive an easy-to-read first-page quality form, 8 in. by 11 in., which will easily fit in binders and file folders. They are going to like that."

Early noted that the new system

(Continued on SR/23)

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Paul D. Winchester, General Sales Manager
Irwin Seating Company

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A Datacorp Productivity Report.

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Is a Computer Output Microfilm (COM) service bureau capable of meeting your micrographic production requirements? For most companies, the answer is yes. Having your information transferred from tape to microfilm by an outside specialist is a cost-effective way to enjoy the benefits of COM without the additional investment that comes with running your own in-house system.

Yet, there are cases where it's desirable to bring COM production in-house.

In-house COM may offer increased security, or the ability to achieve unusually fast turnaround. At very high volume, there may be cost advantages. Or, the decision could simply be an extension of your company's management philosophy.

Whatever the reason, the initial challenge is to select the right equipment, develop software, install the system, train or hire people to run it, and bring everything operational. Operating the system efficiently is a continuing challenge—and a potential problem for the company that lacks experience.

Jim Lewis
Executive Vice President

Datacorp U-COM is an effective way to meet both challenges. It's a complete in-house COM system tailored specifically for your individual requirements. And it's comprehensive support from Datacorp—the world's largest independent supplier of in-house COM.

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In short, we put our ten years and billions of frames of experience to work for you, to ensure that your in-house transition is smooth and trouble free.

But U-COM support doesn't stop there. We perform periodic operational audits for our U-COM customers to help optimize quality, personnel efficiency, and to minimize direct operating costs. We help you realize substantial cost savings by operating your system at peak efficiency.

If you're thinking of going in-house, contact Datacorp before you decide. Because we provide COM service as well as in-house systems, we will help you make an objective business decision that is right for you.

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Replenishes Orders

System Plays Popular Tune for Music Firm

By Paul E. Rocklen
Special to CW

CLAWSON, Mich. — The Handleman Co. here is a leading wholesale distributor — rack jobber — of prerecorded music. A rack jobber manages an inventory of products in a customer's store.

At Handleman, the Retail Inventory Management System (Rims) is used to control and process changing inventories. Rims was designed to automatically develop replenishment orders for a customer's inventory based on recorded sales histories.

Inventory information is captured weekly by sales personnel using Mega Dynamics, Inc. (MSI) Model 88 scanner terminals equipped with a bar code reading wand.

In an effort to reduce operating costs and at the same time improve the response to changing market conditions, a means of generating bar coded labels at each branch warehouse was needed.

Ticketed Merchandise

The Post Ticketing project owes its name to the time and the methods by which a label or "ticket" is prepared and affixed to merchandise destined for shipment to a customer.

Prior to implementation, preprinted tickets would be ordered from a specialty printer. Often, stock would sit on pallets awaiting the arrival of these labels. Upon receipt, labels would be placed on the appropriate items. Ticketed merchandise would then be placed in warehouse bins.

Orders produced by the Rims system would be printed on stock computer paper. The orders contained information used in the picking process: warehouse bin number and quantity.

At the conclusion of the picking operation, warehouse personnel would turn the order over to pricing tables where a separate retail price tag was applied.

With the advent of Post Ticketing, merchandise arriving at a branch warehouse is immediately placed in bins. Orders to be picked are printed as four vertical columns directly on label stock. Each order is prefixed with a 1-in. high "begin" label and is suffixed with a similar "end" label. The tickets are produced in the exact quantity required and in a sequence suitable for picking. As part of the computer-driven printing process, the bar code and retail price are produced.

Critical Importance

Of critical importance to the Rims system is the ¾-in. high bar code. Encoded in these Plessy bars is the class of merchandise (album, 8-track cartridge, or cassette) and a sequentially assigned selection number to identify the item.

This information is repeated in a readable format at the bottom of the label. Surrounding the bar code is a variety of information: artist, title, customer name, store number, manufacturer's list price and a coded category of music.

The bin number and picking quantity appear at the top left of the label and are used by the warehouse staff without the requirement of someone in attendance.

An IBM Series/1 minicomputer with 96K bytes of memory and 9.6M bytes of fixed disk storage was installed at each branch warehouse. Every system is equipped with an IBM line printer and a Printronix Model P-300 printer and had facilities for switched binary synchronous communications at 2,400 bit/sec.

The IBM Event Driven Executive (EDX) Version 1.2 and Indexed Access Method are used as operating software. All programs were written using the Event Driven Language (EDL). IBM-supplied Session Manager programs are used to make the system completely menu-driven.

Joint Effort

The installation of the Post Ticketing applications software at 17 branch locations involved the efforts of many people. In addition to an applications software installation, an upgrade from EDX Version 1.0 to EDX Version 1.1 was required.

An additional 32K bytes of main memory and the Printronix printer was scheduled for installation at each branch location.

The installation of the Printronix printer was coordinated with software installation so that the proper operation of the machine could be tested. Memory was ordered from and installed by IBM prior to the installation of applications software.

> *'Of critical importance to the Rims system is the ¾-in. high bar code. Encoded in these Plessy bars is the class of merchandise (album, 8-track cartridge, or cassette) and a sequentially assigned selection number to identify the item.'*

A team of four installers was trained by the writer. Initially, installers were teamed so that a level of experience could be attained. After two installations, team members were able to perform the tasks solo with the writer available at the central site for support.

Installation Tasks

The tasks involved in the installation of Post Ticketing included offloading several files, loading software and files and, most importantly, operator training.

Two individuals from each branch warehouse were selected by their respective branch managers for training. With no prior experience on the Series/1 or in data processing, these individuals underwent an intensive two-day training session. Approximately 100 programs are available to office personnel for the submission and manipulation of data used in Post Ticketing.

Cost Savings

All programs are accessed through menu selection. Each program and facility was demonstrated and, in most cases, was put immediately to productive use. Efficiencies and savings include the following:

- A 90% reduction in transmission time was realized when transmitting orders in the Post Ticketing format as opposed to print images for a picking report.
- The order filling and processing cycle was simplified through the elimination of a separate pricing step.
- Merchandise no longer waits on the arrival of labels from a specialty printer before being shipped to customers.
- Post Ticketing is expected to save the Handleman Co. more than $1 million each year.

Rochlen is a consultant and president of Mega Dynamics, Inc.

Mortgage Banker to Trim Costs

(Continued from SR/21)

will eliminate a lot of tedious jobs and allow Advance Mortgage to use personnel more effectively. Staff will no longer have to spend valuable time bursting and decollating computer copies.

"One of the nice features about this system is that we will be able to eliminate approximately 80% of our preprinted forms inventory," Early said. "The system will very efficiently reproduce the form along with the data on it at the same time. All we have to inventory are rolls of white paper."

The ability to obtain information promptly is very important to Advance Mortgage, as is the ability to reproduce a report quickly. Operating at 8,000 line/min, the PPS will significantly reduce print time.

Reliability of the system was also an important concern for Davidge. "We contacted a number of companies using nonimpact print systems and found that Honeywell had the dependability we needed," Davidge said. "Besides, the Honeywell office is conveniently located less than a mile away — a real plus in terms of service.

"Now that we are committed to this new Honeywell system, they are working very hard at making this major change easier for us," he said.

The Honeywell Page Printing System will be installed shortly and will be the first such system operating in Southfield, Mich.

"For fast service, my auto parts ride a Greyhound bus."

Bob Christensen, Parts Manager
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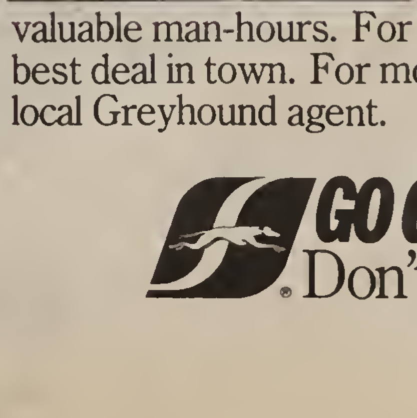

Bob Christensen ships auto parts all over Michigan and beyond. Often the sale depends on delivery time, so Bob uses Greyhound Package Express for pickup and delivery. He likes the fact that we provide greater weight allowance per package and that our fast pickup service saves valuable man-hours. For Bob, going Greyhound is the best deal in town. For more information, call your local Greyhound agent.

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Advances in Printer Technology Catching Up

By **Gary Ampulski**
Special to CW

For the organization that generates large amounts of data — the retail chain, the government agency or the multinational corporation — getting that data onto hard copy is a problem. While the computer processes words and data at the speed of light, the printer has been delivering them to the user as if by covered wagon: slowly, noisily and not very reliably. That means delay, frustration and expense for the user and an enormous challenge for the printer manufacturer.

In attempts to meet the needs of the marketplace, printer manufacturers have tried everything from the daisywheel to the laser, with each "solution" creating as many problems as it solved.

The latest entry in the field of paper-marking solutions is ion deposition imaging, a technology that is expected to make possible new printers with greatly improved reliability and price/performance. To understand why, it is necessary to look at the history of both the printer and the marketplaces it serves.

The first printer, and the one that still dominates the marketplace, was the impact printer. There are two kinds of impact printers: character and matrix. Character printers produce images by simultaneously striking carbon ribbon on paper with fully formed hammer mechanisms like those in a typewriter, so the documents they produce are highly readable.

Matrix printers strike with metal wires or pins, creating dots in patterns that approximate the shape of characters and symbols.

But at speeds rated in dozens of characters per second, both are far too slow in relation to the speed at which data is generated by the computer. Matrix impact printers have poor resolution, and neither matrix nor character impact printers offer much flexibility in terms of typeface or format. In addition, because both are essentially electro-mechanical devices (with the accent on mechanical), they are noisy and subject to frequent breakdowns.

History of Nonimpact Printers

The history of the modern nonimpact printer goes back about 25 years. In an attempt to overcome the limitations of impact printers, engineers at Xerox Corp. set about designing mechanisms that would place black marks on paper without contact.

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*1st choice, OEM Disk Packs, Datamation "Brand Preference Study," 1979 and 1980.

*"All About EDP Media and Supplies," Datapro Research Corporation, September, 1980.

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to Needs of Marketplace

Since then, corporations with enormous resources — notably IBM, 3M Corp., General Electric Co. and Exxon Corp., as well as Xerox — have committed some of their best talents to the task of generating marks on paper electronically.

The result is that there are now high-speed nonimpact printers employing laser scanning, ink jet, magnetic and electrostatic technologies. They include the Xerox 5200, 5700, 8044 and 9700; the IBM 6670 and 6640; the Honeywell, Inc. Page Printing System and the Hewlett-Packard Co. 2680.

High-speed nonimpact printers cost more than $100,000 because they are so complex. Some of them require special paper. The technology they employ requires extremely delicate materials and interaction, so that they are subject to frequent failure. And because all of them employ so many mechanical parts, their price is not likely to come down as the price of electronic components decreases.

Yet despite all these problems, the marketplace for nonimpact printers is burgeoning, simply because they are indispensible — large organizations must have printers that can produce a lot of hard copy quickly. Industry experts believe the total worldwide market for nonimpact printers today is close to $400 million. Assuming that products are available to satisfy it, in five years that market will grow to about $6 billion, or about 25% of the total printer market.

Heart of Device

Although any nonimpact printer comprises three subsystems (input, printing and output), the heart of the device is the print subsystem — the mechanism that converts electrical signals to marks on paper. The hardware necessary to generate the electronic information that represents characters electronically is not the problem. It is the paper-marking subsystem that has needed the greatest innovation.

The challenge has been to develop a paper-marking technology that meets the needs not just of the high-end user, but of the larger marketplace — and to do it in a way that would both improve the quality of output and bring the reliability of the printer into line with that of other office equipment.

Most computer and office automation systems manufacturers (there are about 100 such manufacturers in the U. S. alone) are already at work on the development of high-speed page printers. These manufacturers know how to produce the input and output subsystems; they know how to package and market their products. But they have needed a paper-marking mechanism, or "print engine."

Delphax Systems, Inc., a joint venture of Dennison Manufacturing Co. of Mass., and Canada Development Corp. of Toronto, has developed a print engine that it claimed could change the economics of the high-speed printer. It is called the 2460 Image Output Module.

Development of the 2460 began seven years ago, and because Dennison was then in the label business, it began when Dennison engineers went looking for interesting ways to put marks on paper. The result was an electronic printing concept that is expected to result in printers significantly more reliable than existing products, a Delphax spokesman said.

With this imaging technique, a solid-state print cartridge projects electrically charged molecules, or ions, onto the dielectric coating of a revolving aluminum drum, creating a latent image on its surface. The latent image attracts a single-component toner as the drum revolves, and that toner is applied to paper by the pressure of the drum revolving against another cylinder.

The process does not require heat. Nor does it require darkness, because the drum is not photosensitive. In effect, the module operates like an electronic offset press.

Page printers that employ ion deposition imaging are expected to sell for half the cost of currently available nonimpact printers and will cost less than half as much to operate. They will also be more reliable, because they are of much simpler design than products based on laser xerography and incorporate more electronic than mechanical parts — just the reverse of the ratio in current products. They will print at a rate of 60 page/min.

OEMs will supply fonts, intelligence and cabinetry. OEMs with specific applications in mind — anything from financial packages to reports to computer listings — will also supply the front-end electronics necessary for those applications. Evaluation samples of the 2460 will be available in the third quarter of this year. The Ion Deposition Module can be used in both word processing and data processing systems, as well as in facsimile devices.

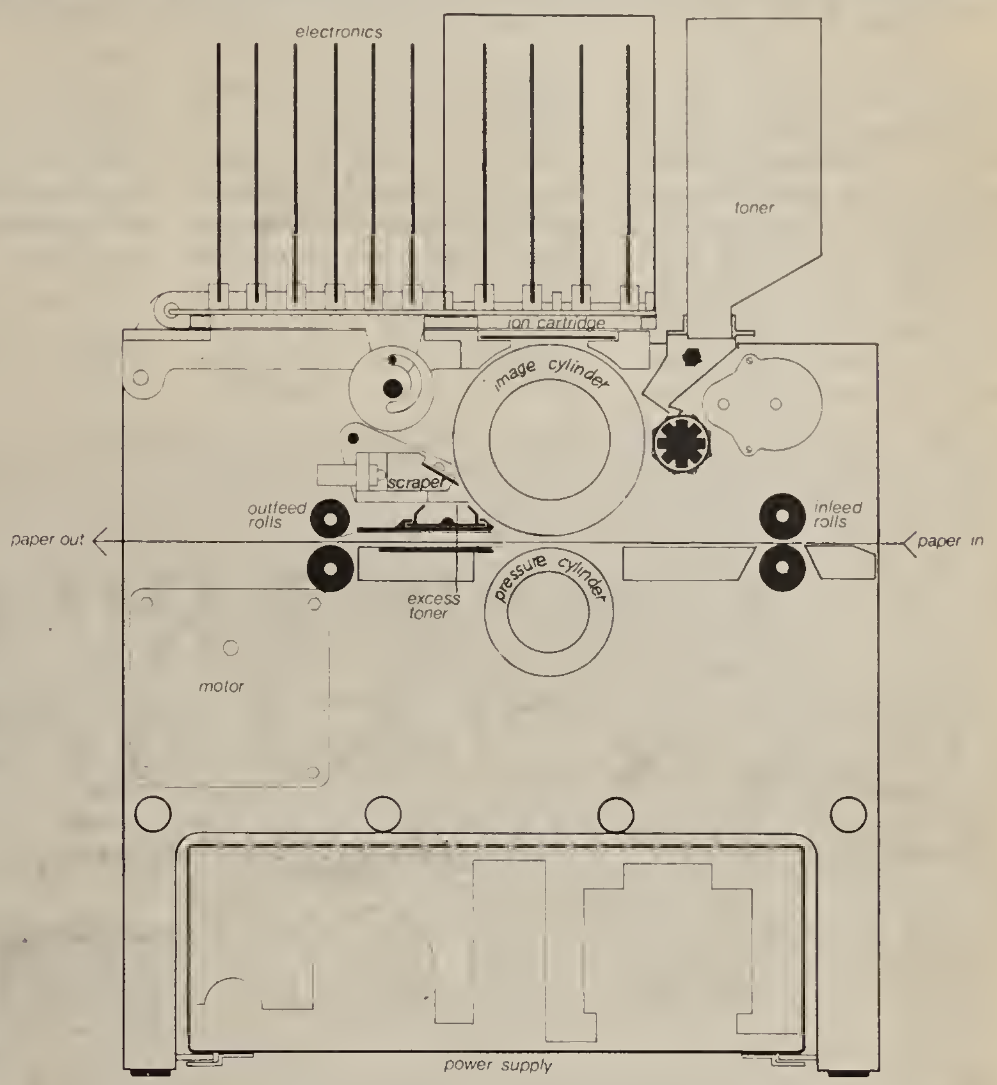
Ion deposition imaging is expected to find its way into configurations ranging from line-printer emulators to fully intelligent printers with graphics, forms, logos and signatures. A line or office applications printer incorporating the technology might cost the end user as little as $35,000 because it will contain fewer parts and more solid-state components.

Ion deposition imaging-based products are expected to provide reliability four times greater than anything yet available and to have very low repair costs.

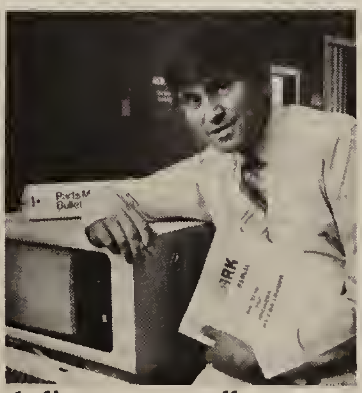
The print quality of such devices will approach that of electrophotographic printers, with a minimum resolution of 240 by 240 dots, or pixels, per inch. Thus they will be suitable for all but the few business applications that require the print quality found in books or magazines.

The development of ion deposition imaging is an example of what is possible when engineers look for simpler, rather than more complex, answers to meeting the needs of the marketplace.

Ampulski is president of Delphax Systems, Mississauga, Ont.



Ion Deposition Diagram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Books Just a Touch Away in Iowa City Library

Special to CW

IOWA CITY, Iowa — Iowa City Public Library gives its 62,000 patrons more information more rapidly since installing touch-sensitive terminals in place of traditional manual card catalogs. By placing a finger on the terminal screen, library patrons can determine the location, call numbers and availability of the 135,000 volumes in the library.

The new terminals also save more than 3,370 hours of staff time formerly needed to produce, file and update information on cards in the manual catalogs.

Unlike most terminals, which require typewriter keyboards, the new terminals have screens sensitive to a user's touch. The touch-sensitive terminals are part of an automated library system marketed by C L Systems, Inc.

Touch Screens

When a library patron touches the area of the screen corresponding to the type of information wanted, it is displayed in large, bright characters.

Using the new browsing terminals, library patrons can choose from an initial menu selection that permits them to search the library's collection by author, title, subject or call number. This initial touch gives them direct access to the on-line data base of the library's host computer.

Once the initial type of search is selected, the user chooses from among a list of key words on the screen the one which precedes the entry wanted. As the dialogue between user and terminal progresses, the search is narrowed until the desired entry appears. The user can then obtain full information about that particular selection, including its location and availability.

First installed in September 1980, the terminals have been placed in the library's reception area, the reference room and the children's room. Library director Lolly Eggers said public reaction to the terminals has been "overwhelmingly positive."

Open House

At an open house introducing the public to the new terminals, "people were amazed. To them, it was like magic. Now, some children excited about the terminals' capabilities are even bringing their parents in to try it." After reading a few paragraphs explaining how the terminals work, patrons have been exploring the terminals' capabilities on their own, with little staff involvement.

"The touch screen terminals are providing both our patrons and our staff with virtually instant bibliographic information," Eggers continued. "They are indicating the location and availability of all copies of our cataloged items. That's a task which manual and microfilm catalog systems have traditionally been unable to achieve.

"The terminals can also let our users see what materials are on order. When we used the manual catalog system, items on order were only filed under authors."

Serving a population that includes many students and faculty from the University of Iowa, the heavily-used library has a circulation of almost 500,000 volumes a year.

"When we surveyed our patrons a few years ago," Eggers said, "we discovered that only 19% of them were using the old card catalog. Since the new browsing terminals have been made available, most people aren't at all reluctant to use them. The terminals are very easy to read, with good clear type faces. That may make them easier for some people to read than the smaller type

(Continued on SR/28)

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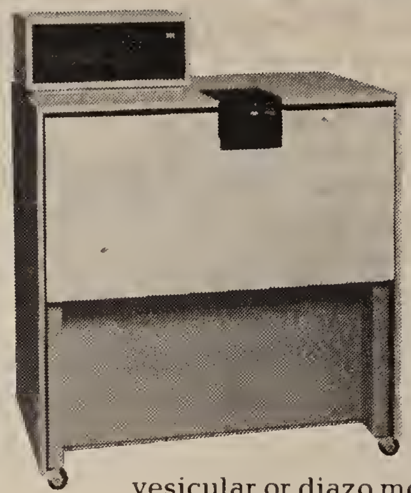

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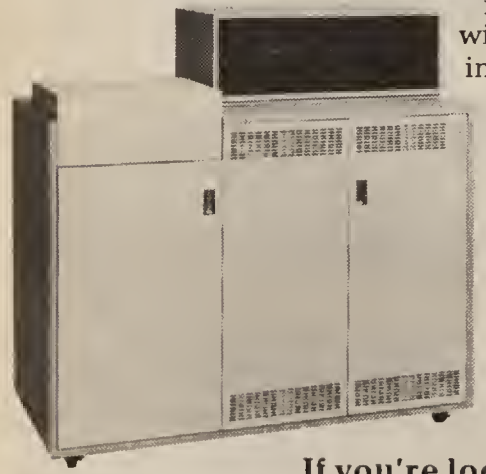

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CW8/31/81

And Improved Quality

Today's Printers Boast New Flexibility Levels

By Robert V. Adams
Special to CW

Electronic nonimpact printers have brought new levels of flexibility and quality to the printing of information generated by data processing systems and other computer-controlled devices. Images are created electronically with these printing systems, stored in digital form and then converted when needed to printed images by the unit's laser scanner.

This whole field really began in 1973 with the introduction of the Xerox Corp. 1200 computer printing system. The unit eliminated the need, in many cases, for preprinted forms and also produced output on 8½- by 11-in. paper. By the late 1970s, the raster-driven, nonimpact printers, including the Honeywell, Inc. page-printer, the IBM 3800, the Siemens printers, and the Xerox 9700, brought even greater flexibility to electronic printing.

As the raster resolution of these printers has increased, more type faces and styles became possible for a greater number of applications. When the raster resolution is increased, the number of lines per square inch are increased and this results in greater flexibility. Thus, the variety and performance range of these devices has broadened considerably, with no indication that the pace will slacken. Nonimpact printing is clearly in the early stages of growth.

Computer Networks

Wider use of computer communications has aided printing flexibility. Computer networks have enabled information processing to move closer to where it is needed — in a faster, more efficient and less expensive way than before. The network allows the user to either centralize those processes or functions that are best centralized, or decentralize those functions that are better done at individual nodes on the network.

With the aid of growing network communications, distributed data processing has become a reality. In turn, this means added information processing and printing options for the user.

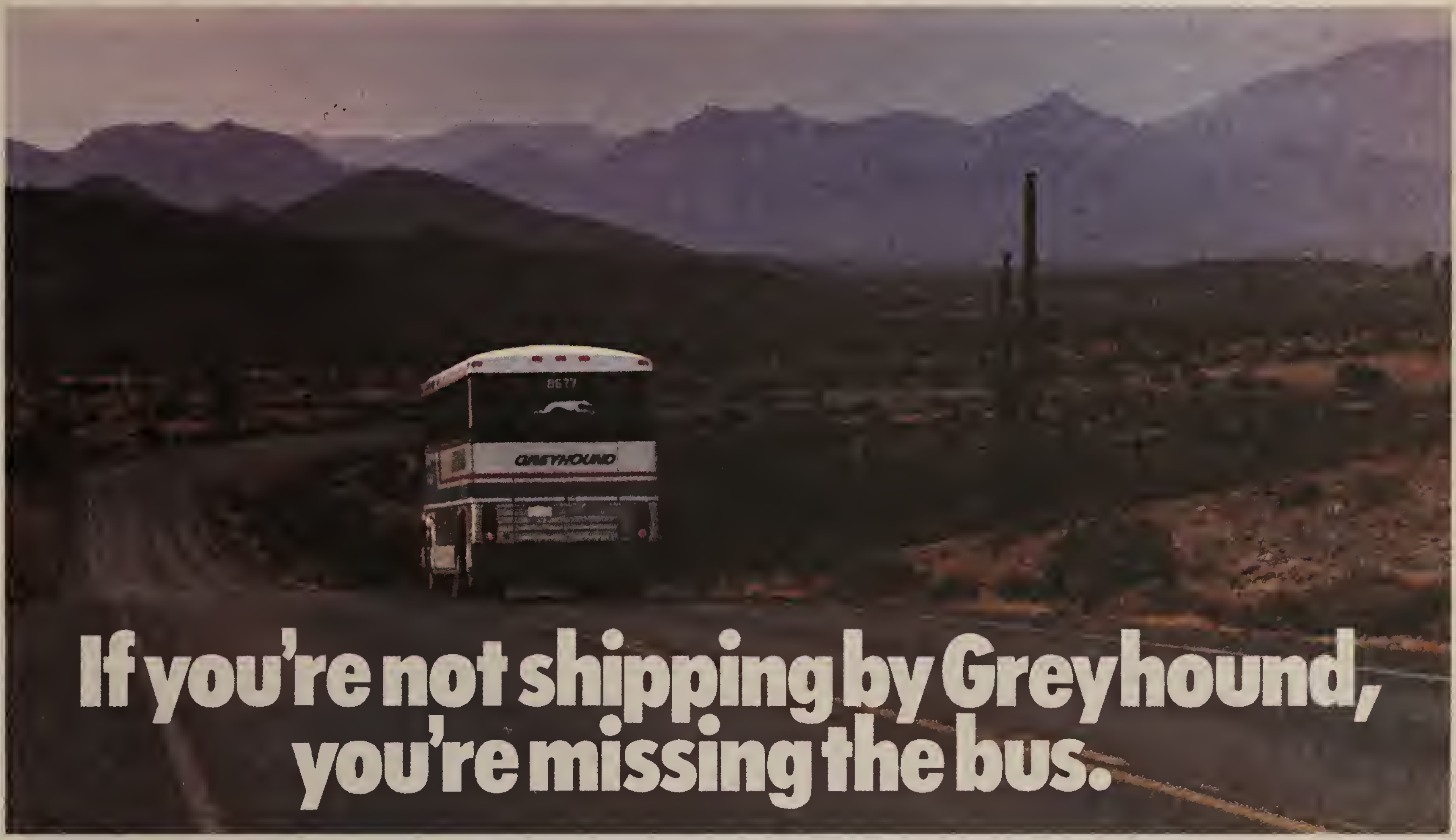
New applications are coming. For example, because of the availability of the network, with intelligence at its nodes, electronic message systems are gaining wider acceptance. In most cases, the network cannot be justified simply by the message system. But once the network is available, it can be employed to send time-critical messages from one location to another. Many message systems work on the basis of mail boxes, whereby the receiver's messages are available for him to query at his desktop terminal.

What are the implications of these networks for nonimpact electronic printers? For one thing, the capabilities of these networks provide an opportunity for expanding the use of electronic printers. Many printing applications can benefit from materials being printed close to where they are needed.

The distributed output of data processing reports has long been recognized as a valuable technique. Moreover, office and word processing systems now also benefit from the ability to distribute correspondence to remote locations.

There will be more options for publishing documents by being able to produce output remotely and in several locations. The possibilities in this

(Continued on SR/29)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Books Only Touch Away in Iowa City Library

(Continued from SR/26)

size on the manual cards.

"People are using the terminals not only to locate a particular book, but also to explore the library's collection in a more leisurely fashion," she said. "We may even have to reserve one unit as an 'express terminal' when the library moves to its new building. Both children and adults sometimes stand in line to use a terminal."

The touch-sensitive terminals aid people in researching their subjects. When they search by subject headings, people can see the subcategories of a subject on the screen. Looking under the "Civil War" subject heading, for example, they can see various headings like battles, songs, music and so forth.

Thorough Layout

The touch-sensitive terminal approach lays out the whole subject more thoroughly. Using a traditional card catalog, people sometimes did not know how to narrow down their search because they could look at only one card at a time.

Library staffers have also welcomed the change to the browsing terminals, Eggers said. To produce, file and change information on the cards in the old manual catalogue required the equivalent of two staff members working full time. "The new system frees these people for more direct service for our patrons. Considering that we have a staff of only 25 full-time people, that's significant," she said.

When the library moves to its new building, five more touch-sensitive terminals will be put in and the library plans to add a community information file to the present menu selections on the terminals.

Key Point

The move to the new building was a key point in deciding to change to the new system. Most libraries are making the transition to either an on-line catalog or putting their bibliographic file on microfilm. The microfilm approach usually means that only quarterly updates of information are possible. The on-line approach does not have this limitation.

The new building will also house a control room and public access studio for a new cable TV system on which the library will have its own channel. With the two-way cable, Eggers is projecting a time when the public can directly check library holdings from their homes.

According to Walter Winshall, president of Interaction Systems, Inc., which designed and manufactured the terminal, the touch-sensitive capability of the new terminals is based on the electrical phenomenon of capacitance.

Unlike earlier approaches to touch-sensitive technology, this approach eliminates the need for active or mechanical elements in or around the screen. Interaction Systems has filed patent applications on the technology.

Each of 22 touch-sensitive data areas on the screen is 40 characters wide and overlays two lines of display. Ten additional areas for control functions facilitate user interaction with the on-line files. The terminal also provides an audible beep and reverse video field for operator feedback verifying the touch-sensitive input. Designed to take rugged public use, the terminals are "patron proof," with no exposed switches or wires.

The terminals employ the asynchronous Ascii RS-232C data communications interface to the host computer. Equipped with a program-accessible two-page display memory, they display high-resolution 10-by-14 dot matrix characters on a 15-in. diagonal screen.

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Printers' Flexibility Brings New Functionality

(Continued from SR/27)

area are extremely interesting.

Perhaps the most significant application developing for electronic printers is in the publishing area. A high resolution electronic printer provides the ability to render many type faces, while maintaining high-speed output.

This has allowed the non-impact printer to serve as both typesetter and printing press for publishing various documents. It is particuarly suited for publications that are updated frequently and where the turnaround time to produce new documents is critical.

The ability to print the necessary number of documents on demand also reduces the potential wastage that occurs when the new edition is published, while copies of the last edition are still on the shelf.

For people wishing to use their electronic printers for publishing applications, formatting is another new requirement. Namely, someone must provide the control information necessary to take advantage of the printer's flexibility for the appearance of the output to be enhanced.

Formatting Capability

The formatting capability built into today's electronic printers allows them to accommodate traditional functions. That is, they can easily duplicate the function of a line printer or the functions of a word processing printer. However, there is nothing inherent in the text output of a word processor, or the print output of a data processing system, that says where it would be appropriate to change type faces.

At the same time, it is impossible for vendors of electronic printing systems to keep up with today's wide range of printing applications and the fact that they require different formatting.

Moreover, since communications networks allow electronic printing to be done in any location, close to its point of final distribution, the size or speed of an electronic printer is no longer a good indicator of the kind of application for which it will be used.

Spec Needed

Because of these two factors, a specification that completely controls the layout of a page is needed. The control of the format for a page would then be a machine-to-machine interface common to all electronic printers.

A formatting standard for electronic printers, which Xerox is currently finalizing, will be a subset of the print and file formats used across Ethernet. (Ethernet is a local area communications network designed to link different kinds of office equipment, such as electronic typewriters, electronic files, copiers and electronic printers within a single building or group of buildings.)

Page Specification

This format, which Xerox calls the Page Specification, will allow the text generating system or process to specify the stored fonts to be accessed and indicate where each character is to be placed on the page and in what orientation.

Arbitrary vertical and horizontal lines of various widths can be placed on the page. The format will also provide the facility to specify windows in the page for material to be inserted from other sources.

Page Specification will be made available not only through Ethernet, but also on external telecommunications, irrespective of the protocol used to transmit information to the printer. Publication of the format is scheduled for late 1981.

Adams is president, Xerox Printing Systems Division.

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October 5 (Day 1)

8:45-9:15 **Keynote**
A-1 Al Lay
President
Cado Systems Corporation

9:15-9:45 **Coffee Break**

9:45-10:45 **Mini & Micro Based OEM Business Update**
A-2 Lawrence Chimerine
President
Chase Econometrics, A Div.
of Chase Manhattan Bank

Richard Raysman
Attorney/CBN Columnist
Brown & Raysman

8:45-10:45 **The Magic of Sales**
A-3 Robert Hardy
President
Computer Composition International

11:00-12:00 **OEM Survival Tools for the 1980's**
A-4 Jack Keen
Director, Management Products
Input

11:00-12:00 **Acquisition and Diversification**
A-5 Gilbert Mintz
Partner
Broadview Associates

Robert J. Conrads
Principal
McKinsey & Company

12:00-1:30 **Luncheon**
Art Holst
Author/NFL Official
"The Challenge of a Pro"

1:30-2:30 **Influence of Growing Local Networks (Part I)**
N-1 Chairperson:
Robert Wickham
Vice President, Marketing
Vector Graphic, Inc.

Robert D. Brannon
Marketing Manager
OEM Microcomputer Systems
Intel Corporation

2:45-3:45 **Influence of Growing Local Networks (Part II)**
N-2 Dr. Harry Saal
President
Nestar Systems

Ivan Socher
President & CEO
Amdax Corporation

2:45-3:45 **Intelligent VDTs and Desktop Systems**
N-3 Jon R. David
President
Systems R & D Inc.

Brian Green
Regional Director
Tandem Computers

1:30-2:30 **Input/Output: Market & Technological Structures**
T-1 Joseph G. Morris
Senior Vice President
Ramtek

Meldon K. Gafner
Director of Marketing Communications
ISSCO

Peter Eisenhauer
Vice President, Marketing
Integral Data Systems

2:45-3:45 **Mass Magnetic Memory: Market & Technological Structures**
T-2 Chairperson:
Andrew Roman
Consultant
Random Access International

Larry Hemmerich
Vice President
Cipher Data Products

4:00-5:00 **Voice I/O and Other Analogue I/O: Market & Technological Structures**
T-3

Len Magnuson
Vice President, Marketing
Centigram

Edward O'Neil
Marketing Manager
Voice Products
Interstate Electronics

1:30-2:30 **Retail Outlets**
O-1 David Pava
President
Byte Industries

Philip L. Reed III
General Manager
On Line Microcenters

2:45-3:45 **Are You Ready for An Ad Agency?**
O-2 Chairperson:
Thomas Casalegno
Publisher
Computer Business News

Robert McCullough
President
Aitkin-Kynett/SCB

Steven Tatum
Director of National Marketing
Televideo

4:00-5:00 **OEM Agreements**
O-3 Sonny Monosson
Chairman of the Board
American Computer Group, Inc.

1:30-2:30 **Application Generating Tools**

S-1 Chairperson:
William R. Stow
President
CPU International

Kent Lawson
President
Magna Systems

Chuck Butkus
President
The Software Factory

2:45-3:45 **Software Managment Strategies**
S-2 James Pettinger
Consultant/CBN Columnist

Stephanie Rosenbaum
President
Tec-Ed

4:00-5:00 **Application Dynamics: Planning for Changes**
S-3 Gary Long
Partner
Lupper & Long

1:30-2:30 **Microcomputer Trends**
P-1 James J. Farrell III
Manager, Technical Communications
Motorola, Inc.

Casey Powell
General Manager
Special Systems Operations
Intel Corporation

2:45-3:45 **Legal Aspects of the Third Party Market**
P-2 Peter Vogel, Esquire

4:00-5:00 **Desktop Computers**
P-3 Allen Michels
President
Convergent Technologies

1:30-2:30 **IBM Watch**
C-1 George Pazloff
Director of Value Added Remarketing
General Systems Division
IBM

H. W. Mattison
Program Manager
Value Added Remarketing
General Systems Division
IBM

Paul H. Espersen
Series 1 Technology Consultant
IBM

2:45-3:45 **HP Watch**
C-2 Bob Kresek
Marketing Manager, Worldwide
Third Party Sales
Hewlett Packard

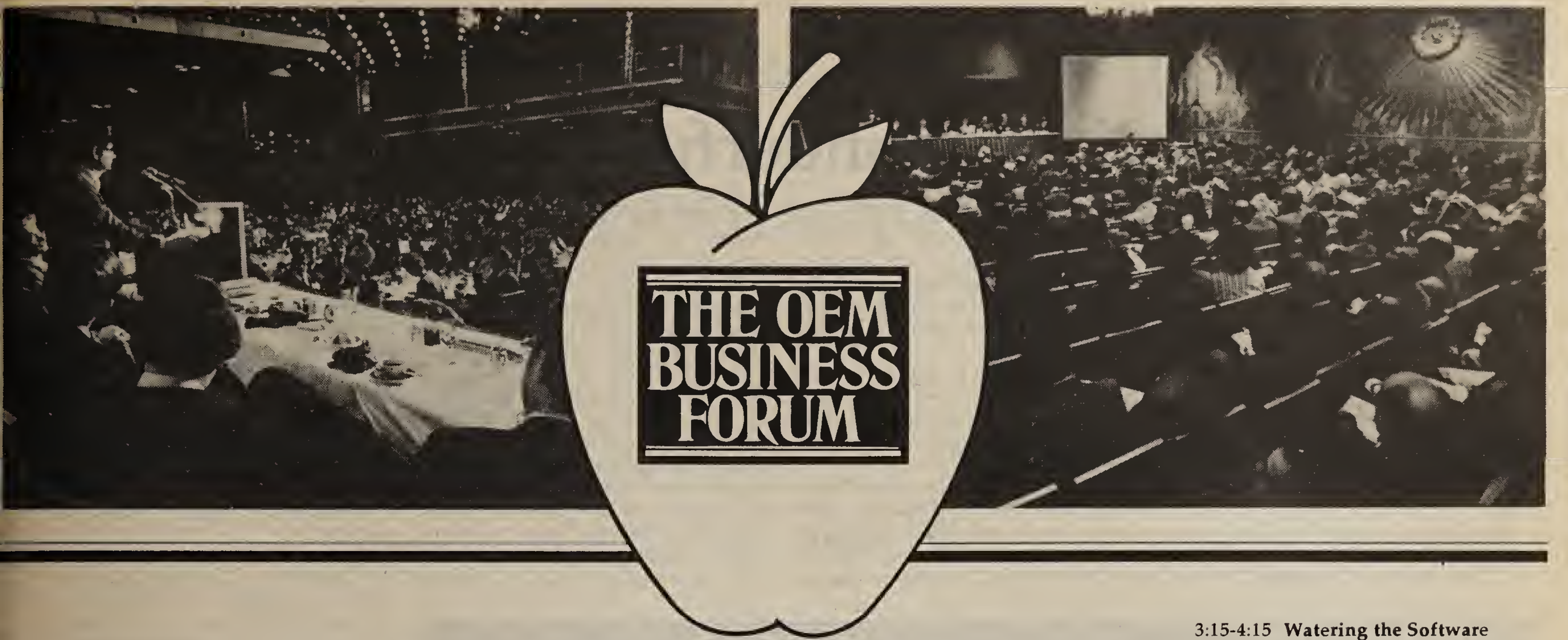
4:00-5:00 **TI Watch**
C-3 Dr. W. Kenneth Wickham
OEM Marketing Manager
Texas Instruments

October 6 (Day 2)

8:30-9:45 **Japanese Vendors "Meet the Press"**
B-1 Thomas Hodson
National Sales Manager
Canon USA, Inc.

John Rehfeld
Vice President
Information Systems Div.
Toshiba

J. Garrett Fitzgibbons



THE OEM BUSINESS FORUM

Vice President & General Manager
TRW-Fujitzu Company

Philip E. Wyatt
Manager
Office Products Division
Sony Corp. of America

9:45-10:15 **Coffee Break**

10:15-11:15 **Software: The Growth Area of the Decade**
B-2 Ann Winblad,
Marketing Director
Product Planning
Open Systems, Inc.

James Pettinger
Consultant/CBN
Columnist

10:15-11:15 **Financing Your Business and Product Development**
B-3 Gordon Rapkin
Chief Executive Officer
AMSI

11:30-12:30 **Sales & Marketing Planning**
B-4 Howard Levin
Director, Systems Marketing
Arrow Electronics, Inc.

11:30-12:30 **Stop Giving Away Services**
B-5 George McArthur
Sales Manager
Decision Data

12:30-2:00 **Luncheon**

William Moore, Jr.
Vice President, Computer Operations
Perkin-Elmer Corporation

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October 5th and 6th, 1981
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2:00-3:00 **Europe as a Market**
M-4 Christopher Codrington
Interco Business Consultants, Ltd.

3:45-4:15 **Beyond the European Market: The Next Step?**
M-5

2:00-3:00 **PR: The Unified Corporate Philosophy**
U-4 Chairperson: Vic Farmer
Editor
Computer Business News

Carole Ely
Sr. V.P., Communications
Vector Graphic, Inc.

Mark Nigberg
President
The Nigberg Corporation

3:15-4:15 **Office Automation: One Stepping Stone Beyond WP?**
U-5 Phil Roybal
Manager, Computer Programs
Apple Computer

Thomas R. Sinopoli
President
Thomas R. Sinopoli Assoc.

2:00-3:00 **Special ADAPSO Session**
P-4

2:00-3:00 **Sourcing Software**
S-4 William Grinker
President
American Computer Group, Inc.

3:15-4:15 **Watering the Software Desert**
S-5 Ben J. Dyer
President
Peachtree Software Inc.

Barbara L. Stafford
Director, Sales & Marketing
TCS Software

2:00-3:00 **DG Watch**
C-4 Patrick Dodds
Marketing Manager
General Distribution
Data General Corporation

Al Ormiston
Product Mktg. Mgr.
Data General

Richard R. Farwell
Director Mktg. Support
Small Business Sys. Div.
Data General

3:15-4:15 **DEC Watch**
C-5

"SPECIAL EARLY BIRD SESSION"
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7:45–8:30 AM
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Registration Information

Cost is $295 for two full days of sessions and lunch each day. There will be a $50 service charge for cancellations after September 28. Registration may be transferred at no charge. Contact the New York Hilton directly for hotel accommodations; call 212-586-7000, and mention you'll be attending The OEM BUSINESS FORUM.

Registration Form

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30 Multi-Quantity End Users
40 Manufacturers of Computer Systems or Peripherals
50 Manufacturers of Office, Business, Personal and Consumer Systems
60 Hardware OEMs
70 Distributors/Dealers/Retailers
80 Consultants
90 Other (Specify)__________

B. Title/Function.
Please circle ONE only.
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20 Operations Management
30 Software Development
40 Engineering
50 Marketing
60 Consultants
70 Researchers/Educators
90 Other (Specify)__________

C. Size of Organization (no. of employees)
__A. Under 100 B. 100–499
__C. 500–999 D. 1,000–4,999
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D. How did you hear about the OEM Business Forum?

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CW 5

The Not-So-Easy Wonderful World of On-Line

By John Patrick Hurley
Special to CW

My DP shop, sorry to say, was probably typical — plagued with requests for rush specials and voluminous status reports. The specials were usually not thought out very well and consequently were not used or needed to be redone often.

By the way, they were needed yesterday and took priority over the big projects, only to be forgotten when I missed the big project completion date.

The status reports, in their own way, were not much better than specials. It sure was frustrating to see those 10 copies of 400 pages each gathering dust on a shelf after they took 30 minutes to run and another 15 minutes to distribute — usually run at month's end when we had our heaviest load from accounting and marketing.

But the users just had to have their status reports in case something went wrong — by the second week of the month they were too outdated for further use.

With the introduction of CRT terminals when we upgraded to IBM System/34, I anticipated marvelous opportunities — the wonderful world of on-line. I would be able to eliminate those specials and status reports by programming inquiry screens with various keys for my major files — you know "find all the customers in Cookamonga or all the vendors named Jones including Abt, Jones, and Archer, Inc."

What the heck; the airlines have been doing tougher stuff than this for years. Now the users would be able to roam through files, at their leisure, changing their minds, determining new needs based on what they just found out from the up-to-the-minute on-line fields. And instead of huge reports, all they would have to do is hit the print key and get a hard copy of whatever was displayed on the screen.

But life was not that simple. Those airlines had taken 15 years, millions of dollars and hundreds of programmers to get there. When you cannot afford first class, your only other choices are economy or "it won't fly."

Computers have vastly improved over the years, but it still requires highly talented programmers from three days to three weeks to develop a multiple-key inquiry screen for each file.

This approach was impractical with my load of requests and novice on-line programmers.

What I needed was a way to create inquiry screens that would allow as many as eight different ways to search a file, display a full screen of identifying data for records beginning with the exact match or next closest, permit misspelled words, provide browsing capability and the ability to display detailed data about the record selected.

Furthermore, the technique had to be usable by novice programmers and require less than eight hours to produce error-free screens. This objective was enough to worry a person sick.

For 15 years, I have been directly and indirectly involved in coding logic to have the computer perform desired outputs for the users. Maybe it was time to have the computer save me time. Couldn't the computer be programmed to output RPG statements? Sure it could. After all, RPG is processed to output assembly language and assembly language is processed to output machine code. All I needed to do was write a program that writes programs.

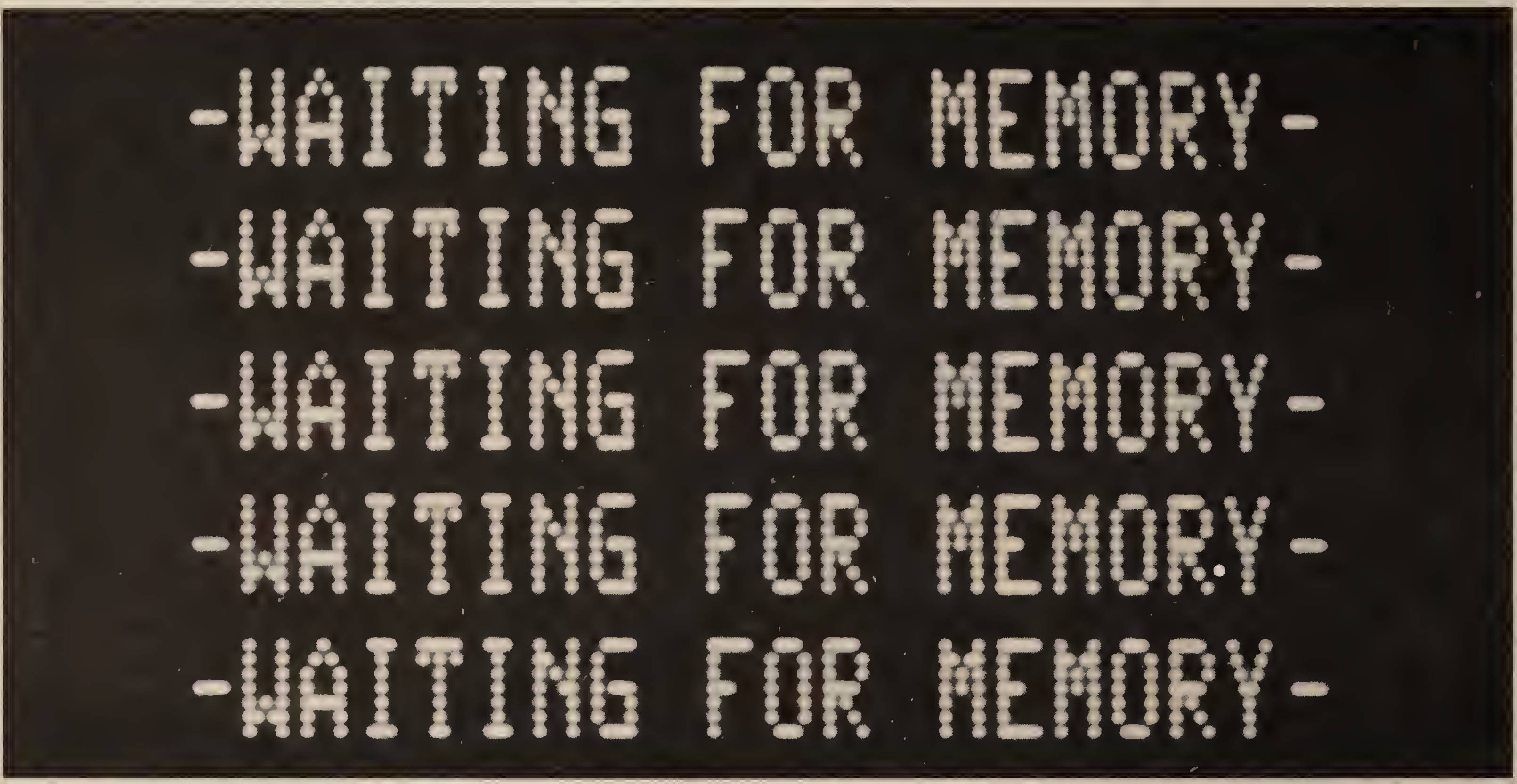
Success Story

Fortunately, this is a success story and the program that writes programs (program generator) far exceeds my original objectives. A person who knows very little programming can produce error-free inquiry screens in about one hour. The logic capabilities are powerful enough to allow browsing capability of one file, and then inspection of other files for related data. An example of this would be browsing the customer master until a selected customer is specified and then a choice is made to either display all the open orders or open receivables for that customer.

The results were so productive that I have since developed program generators for other purposes like creating labels, writing reports and data base management. Some of the benefits have been user flexibility and satisfaction, 50% more programming time for new projects, 15% reduced printer load and 10% savings in paper.

If you are from a big shop like the airlines or are an old-timer like me, you will have to see it to believe it. But believe me, it is a much nicer job when the user is slapping you on the back instead of pointing fingers.

Hurley is a computer productivity consultant.



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NEW YORK — The SKF Group, a Sweden-based bearing, steel and cutting tool company, is one of the world's truly international businesses. Activities throughout its 170 companies, including approximately 80 manufacturing units, reach all corners of the world. Every month the accounts from 70 or more subsidiaries or subsidiary groups are received at its Gothenburg, Sweden, headquarters.

SKF faces the difficult task of cohesively managing such a diverse group and, at the same time, ensuring that all units operate in complete harmony. This objective becomes even more challenging because SKF is also undergoing the challenge of expanding into the precision engineering and special steel sectors, markets outside its traditional rolling-bearing business. All these factors add to the difficulty of gaining an overall view of these interrelated activities and place heavy demands on SKF's financial control systems.

SKF turned to General Electric (U.S.) Information Services AB in Sweden to improve the collection and consolidation of reports and the quality of input data, all of which are vital to the success of its control systems. This success will, in turn, help SKF, which holds a fifth of the world market share of its primary product, meet the pressures of worldwide competition.

Focus on Financial

One of the functions that has become recipient to management's ever increasing demands is the financial department, whose task it is to consolidate the monthly reporting and final accounts. This concerns a group with yearly revenues of approximately $2.5 billion and more than 55,000 employees. More than 90% of revenue comes from foreign operations.

The first step was to standardize the contents of the reports and the accounting methods by which the figures were prepared. Special attention was given to ensuring that uniform principles were applied to all of SKF's subsidiaries, as well as to the continuity of the reporting by the individual companies and the parent company itself. A summary of the guidelines for this procedure was presented in an SKF financial manual.

However, the reports were still being sent by post or Telex and, consequently, many problems still had to be solved to satisfy management's requirements.

Reports from the subsidiary companies often arrived late for a variety of reasons. The most frequent explanation was that "our computer's been on the blink," or "the person responsible has been off sick." The explanation that was most difficult to check was that "the reports are in the post," followed later by "they must have gotten lost on the way."

When at last the reports had all been received, work would start on consolidating them. Since there was always at least one report that arrived late, the preparation of the consolidated accounts had to be carried out under severe time pressure and people had to put in long hours of overtime.

Furthermore, errors in the reports were often discovered and the subsidiaries then had to be telephoned or Telexed so that the appropriate corrections could be made. Likewise, the subsidiaries themselves would inform the office of corrections, which meant that the consolidated accounts frequently had to be prepared all over again. Finally, of course, there was ample scope for mistakes to be made in the final preparation.

The next step in the development of SKF's accounting system was to mechanize the routines. The main choice lay between either speeding up the method by which accurate reports were submitted or by mechanizing the actual preparation of the consolidated accounts.

After a preliminary study, the decision was made to assign priority to the collection of the reports and to the quality of the input data, as these were considered to be the main bottlenecks in the preparation of final accounts.

During the initial phase, SKF made inquiries to its regular suppliers, to an international firm of accountants and to General Electric (U.S.) Information Services AB. The former two possibilities could manage the consolidation work, but only influence the speed of reporting or the quality of the input data to a limited extent.

(Continued on SR/34)

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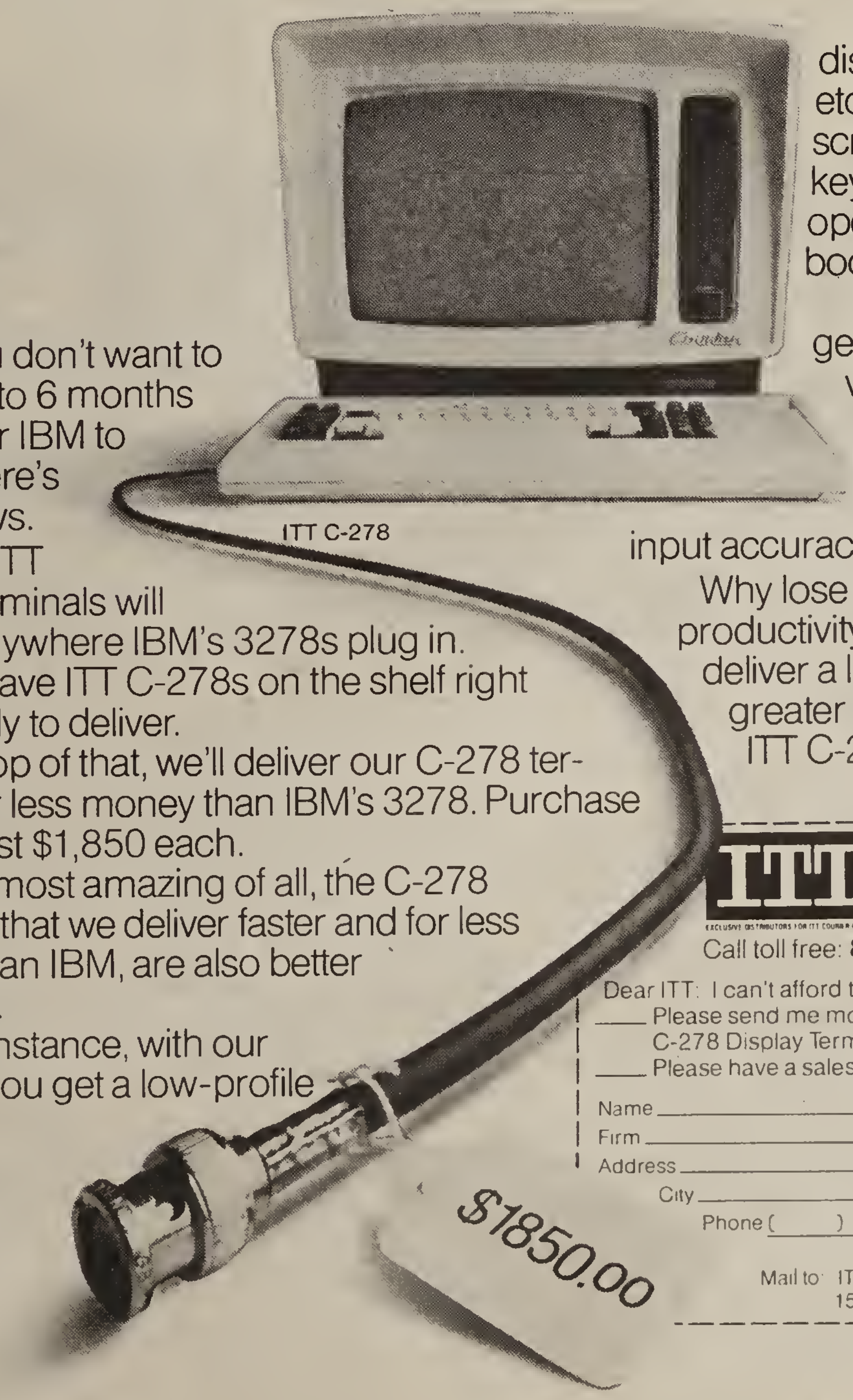

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Service Helps Tool Firm Consolidate Data

(Continued from SR/33)

However, General Electric Information Services' Mark III Service, with its global teleprocessing network, could handle the reporting, the quality of input data and the consolidation of the SKF final accounts.

System Implemented

The production of new accounting methods took one and a half years, after which things began to speed up. Talks with General Electric Information Services began in early spring. Three months later a preliminary study had been completed and by fall, the final decision on initiation of the development work had been made.

In early December the system on Mark III Service was ready for final testing. Having tested the system successfully on the accounts of a previous period, the financial department decided to shelve the manual routines completely and rely on the new system for the preparation of the year's final accounts.

The companies submitted their forms in the same way as before. These were punched and transferred to Mark III Service, which then performed the entire processing.

In the past, the subsidiaries submitted their reports by post or Telex. Now, the reports are sent directly by computer terminals. Those who already had access to terminals can continue to use them. The smaller companies can also continue to use their Telex machines, although now these can serve as terminals to Mark III Service.

Easy, Efficient Verification

A company connected to the system updates its own local data base using the balance sheet and income statement forms, together with appendices. The updating routine checks the subtotals on the forms. A form cannot update the data base unless it is formally correct. Once the forms have updated the data base, they are verified.

Verification implies a cross-checking of the forms and a reconciliation to see that the opening balances agree with the closing balances, after consideration of the changes that have occurred in between.

Once Mark III Service has indicated that the accounts are formally correct, they can be made available to SKF headquarters. Headquarters does not have access to the final accounts of a subsidiary until Mark III Service has approved them and the subsidiary has released its data base.

When a subsidiary has released its data base, it is time for the financial department to take over. This is achieved as follows: A program is run to collect the companies' data bases and transfer them to the central data base. When the final accounts of all subsidiaries have been released, consolidation of the accounts commences.

As an aid to the financial department, the system provides lists containing all of the information necessary for consolidation of the accounts. The work of producing the items to be eliminated to achieve consolidation is carried out manually. When this is completed these items are input to the system in "fictitious companies," with one company for each type of elimination. Thereafter, the system calculates the consolidated result. The consolidation level is optional (area level or divisional level).

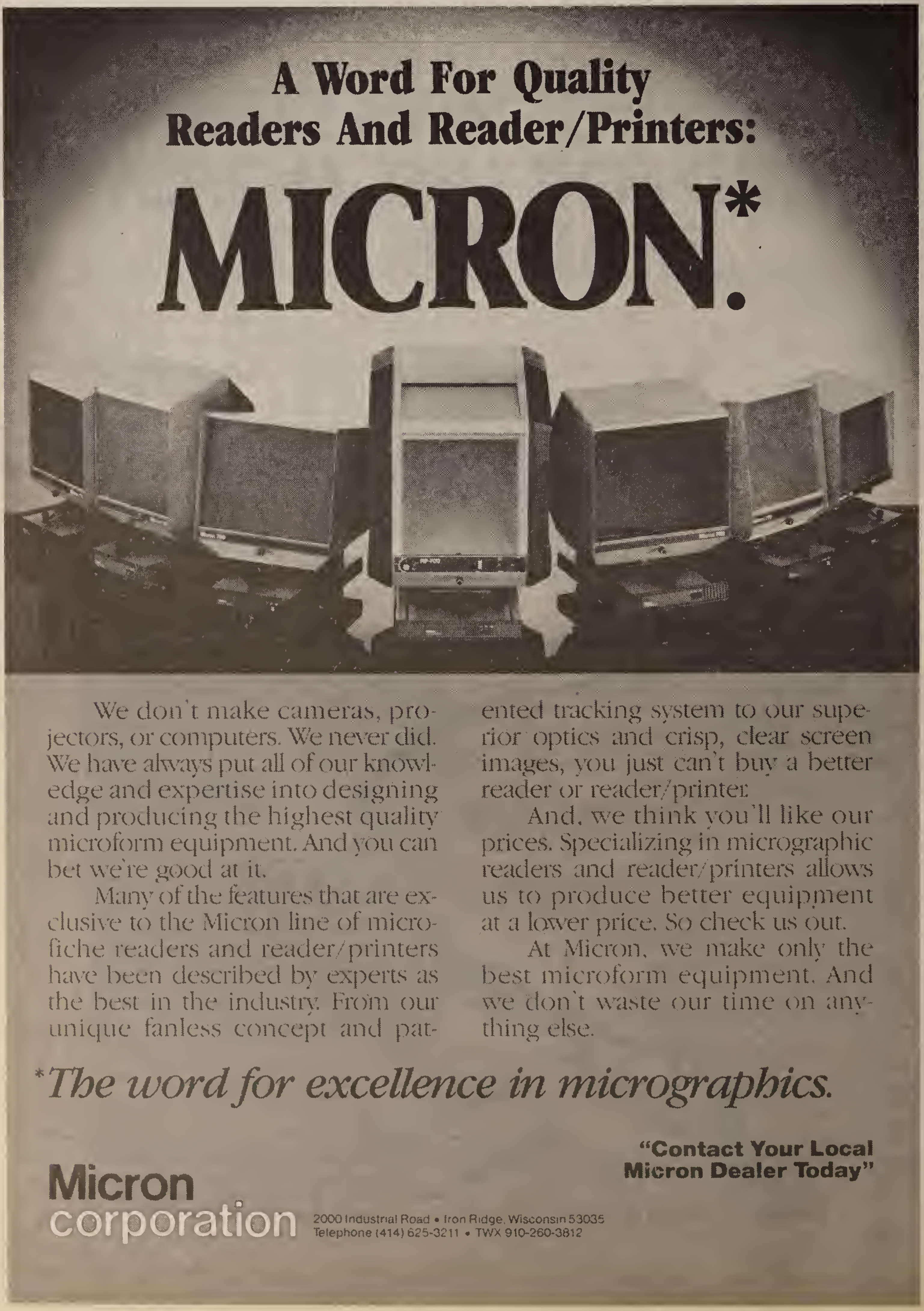
Every month, group management receives a series of reports. Since many of the particulars are stored in the data base, the routines to prepare these reports have been mechanized. In addition, because the GE Information Services languages are easy to use, the financial department staff can work with DMS and Tabol themselves. Apart from the production of special reports, they can also write small programs to facilitate the work on the consolidated accounts.

The principal advantage lies in the time that is saved and the improved quality of data. The timesaving is partly because it is now easier for the subsidiaries to submit their final accounts in time, which means that work on the preparation of the consolidated accounts can begin earlier.

Another important advantage of the system is that the data base can now be used to produce special reports, which, for reasons of time, could not be produced in the past.

From the beginning, the system was designed to be able to cope with any additional information from subsidiaries as it became necessary. At present, all reports fed into the system are in Swedish kronor. Plans have been made to modify the system to accept local currencies and, eventually, to have Mark III Service handle all currency conversion.

The store of reliable information that is gradually being collected will be used in analysis work, which will enable more effective follow-up of SKF's profitability.



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• *Business Booming*

Inventory System Tied

Special to CW

WARREN, Mich. — The general economic environment of Detroit — geared to the automobile industry — has faltered and sputtered while waiting for an infusion of new car orders. But business at Peninsular Steel, a steel distributing company that serves the area's tool and die industry, has continued at a steady pace.

Company officials credit at least part of their prosperity to their computerized inventory control system that uses distributed data processing equipment.

With a network of computers linking the company's warehouses in nine cities to the corporate headquarters here, officials of the privately owned company of 350 employees have found they have no problem keeping daily tallies of their entire corporatewide inventory of steel bars and plates. And, they have found, efficiency can make a big difference during hard times.

Benefits from Computerization

"We have felt the economic setback, but the faster information we now have has allowed us to handle our work load better and cheaper," noted Les Ware, Peninsular Steel's secretary treasurer.

"It used to take 15 days past the end of the month to close out that month's inventory. Now it takes two days. Accounts receivable closeouts used to drag to the 10th or 15th of the following month and now we have it in three or four days. We also have better control over our orders — they're in one place in the computer, not on pieces of paper spread throughout the office," Ware added.

Remote Sites

The company's distributed computer system uses Datapoint Corp. desktop processors in each of the nine remote warehouses. Each processor communicates over the phone lines to a large mainframe at headquarters using Datapoint's Multilink software. This software allows the computers to communicate directly with a wide variety of mainframes, explained Lauren Becker, DP manager.

Files of the company's 13,000 inventory items are kept on the mainframe's disk storage. Whenever information is needed, the warehouse computers can call in to the corporate mainframe. Inventory changes can be signaled immediately. The result is that anything shipped out Monday, for instance, is deleted prior to Tuesday's inventory, either at headquarters or at the branches, Becker explained. Thus, everyone has an accurate record of inventories.

Mainframe 'Front-Ends' Mini

"Our system is different from most," Becker explained. "In most systems, the mainframe would be the host computer with the minicomputer 'front-ending' it. But our application software is actually on the distributed computer and the computer can operate with or without the mainframe.

"The mainframe functions solely as a file processor. So, the Datapoint processor is really the host computer," she said. Ware explained that Peninsular Steel, founded in 1916 by the Kurtz family, computerized in early 1977.

The firm rented a mainframe and put an inventory control application on it. However, they found work was being duplicated between the headquarters and the warehouses. When something was shipped, the warehouses would re-

Introducing the First Annual "Computerworld" for Television Computer Graphics Contest.

We are looking for interesting, entertaining and creative computer-generated graphics which we can display on our weekly TV newsmagazine "Computerworld," now being shown in 13 major markets around the country.

If you have been involved in the design of any such graphics and would like to see them displayed on TV, then we encourage you to enter them in our contest. Individuals, groups or corporations are allowed to enter. If your entry is chosen as one of our semi-finalists, it will be shown during one of our programs between features, and you or your organization will be given appropriate credit.

Rules and entry information:

We've tried to make things as simple as possible. Basically anyone can enter. You need to have a computer-generated graphic of about 5 to 10 seconds in length (longer is OK if it can be cut into short segments), and you need to be able to submit it either on 16MM film or any standard format videotape (from Beta or VHS to U-Matic to two-inch). Unfortunately we cannot accept entries in any other format (computer instructions on disc or tape are unacceptable, for example).

"Still" graphics generated by computer and then put into "motion" with standard animation techniques are acceptable when submitted on one of the forms above, as are graphics which involve other manual intervention to enhance the computer's work.

Entries will be judged by "Computerworld's" producers on the basis of originality, entertainment value, artistic merit, suitability for broadcast, interesting or unusual use of computers in development and overall "impressiveness". Decision of the judges is final.

By entering, you attest that you possess full rights to the graphic being submitted, and you thereby grant rights of broadcast as described above to CW Broadcasting, producers of "Computerworld." You also attest that the people or organization listed as designer/creator of the entry are, in fact, the true creators/designers. (If you purchased graphics from another firm, list the firm responsible for the purchase as well as the firm which supplied the graphics.)

Entries must be sent to:

Computerworld TV Graphics Contest
Box 880
Framingham, MA 01701

Entries will be returned. Deadline for entries in this first contest is December 31, 1981. Entrants may be selected as semi-finalists before all entries are submitted. Finalists will be selected from semi-finalists after all entries have been submitted. Finalists will receive a certificate from CW Broadcasting.

COMPUTERWORLD
PRODUCED BY CW BROADCASTING

ENTRY FORM (A separate sheet of paper containing following information may be used.)

I have read the rules above and understand them. I attest that the organization or people listed as entrants own all rights to the enclosed entry and hereby grant broadcast rights to CW Broadcasting for use as described above.

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Distributed Data Key •
To Steel Firm's Success

vise their manual inventories and then mail the transaction to Warren, where the computer's inventory would be adjusted accordingly, Becker explained. The slowness of the mail prevented the computer from keeping abreast of the warehouse's records on a day-to-day basis.

"While the slowness of getting the information was one problem, we also wanted more autonomy for the branches," Becker added. "My experience with distributed data processing systems is that the hammer is usually held by the corporate facility. It's a case of 'You will react a certain way because that's what we programmed into the corporate computer.' But our branches have always been autonomous — we couldn't take that away from them and tell them it was an improvement."

When the equipment was acquired, computer operators for the branches were re-assigned internally and went into the Warren headquarters for a six-day training session.

"We didn't have any opposition to the change — everyone was eager to participate," Becker said. "If we had hired people from the outside, they would have had to learn our company, plus the computer system. Our people only had to learn the computer system."

The employees who trained on the new system returned to Peninsular Steel warehouses ready to implement the system in Chicago; Buffalo, N.Y.; Cleveland, Akron, Dayton and Toledo, Ohio; Indianapolis; and Grand Rapids and Flint, Mich.

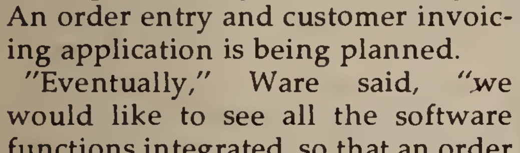
The systems are now used for inventory control, purchasing, receivables, profitability and sales analysis. An order entry and customer invoicing application is being planned.

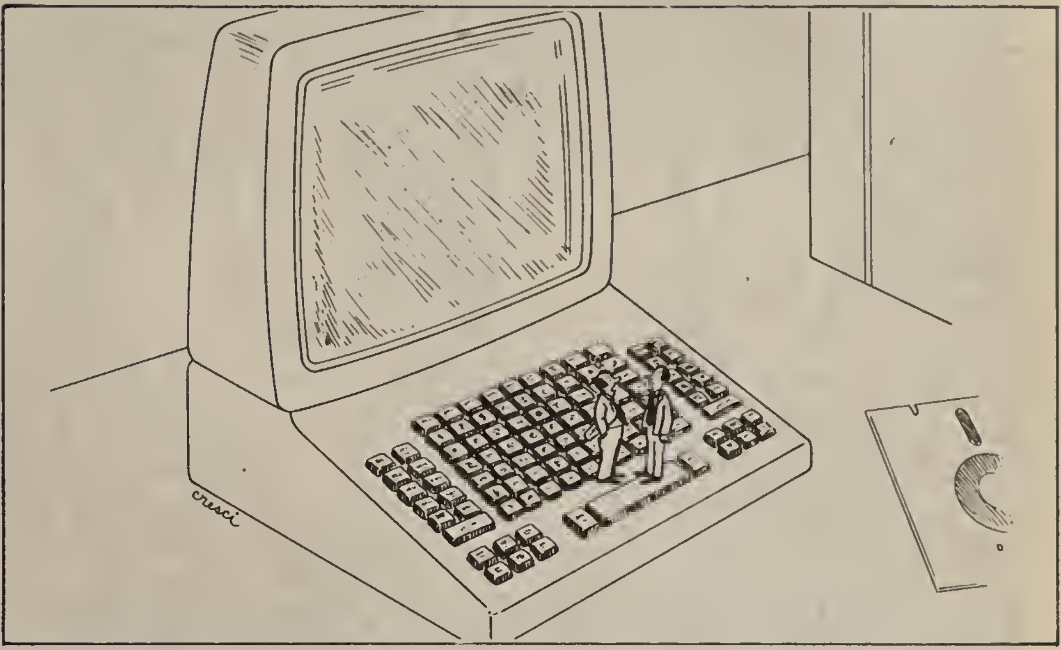
"Eventually," Ware said, "we would like to see all the software functions integrated, so that an order entry would generate an inventory change, which would trigger a shipping order, which would generate a billing statement and so on.

"But," he cautioned, "we don't want to get to the point where there's no human intervention, where the system automatically puts out letters you know that no one has ever looked at. Our business is built on service and we don't want to ever get away from that personal relationship with our customers."

All programming for the company, including a customized word processing application, has been done internally by Becker's three programmers.

Other features of the Peninsular Steel system include the ability to track sales history for every one of the 13,000 inventory items. The files used by the pricing system also include the cost of the item, so that its gross profit margin is immediately available.


'Yes, I Fed It Your Calculations and It Responded, "Surely You Jest." '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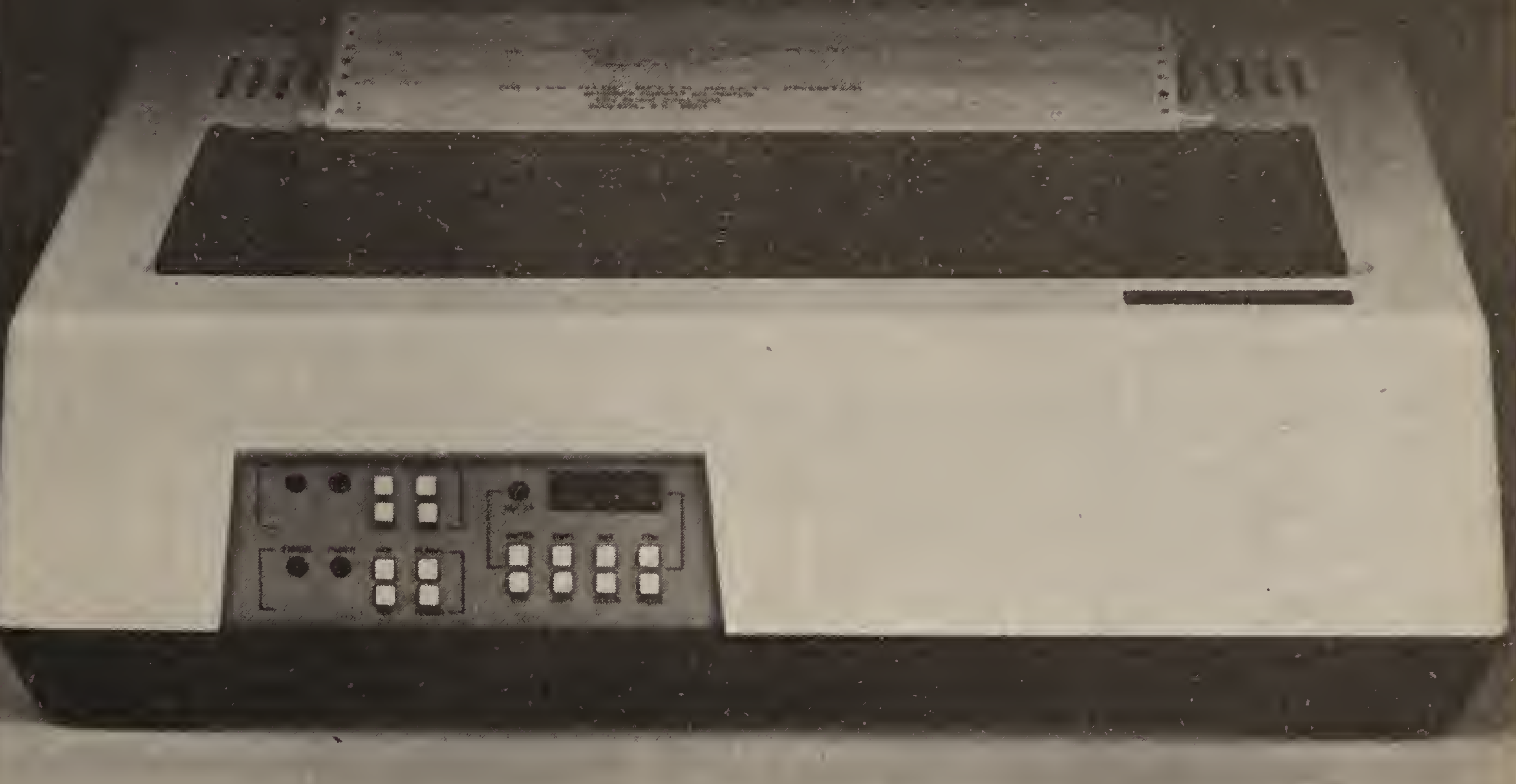

With so many matrix printers on the market today, it may seem tough to find exactly the right one for your application. Some models may offer the speed you need, others the communications flexibility and still others the forms handling capability. But no printer offers all the features you need...until now.

The DS180 matrix printer provides the total package of performance features and reliability required for applications such as CRT slave copy, remote terminal networks and small to mid-range systems. Not a "hobby-grade" printer, the DS180 is a real workhorse designed to handle your most demanding printer requirements. And pricing on the DS180 is hundreds of dollars below competitive units.

High Speed Printing—Bidirectional, logic-seeking printing at 180 cps offers throughput of over 200 lpm on average text. A 9-wire printhead life-tested at 650 million characters generates a 9x7 matrix with true lower case descenders and underlining.

Non-volatile Format Retention—a unique programming keypad featuring a non-volatile memory allows the user to configure the DS180 for virtually any application. Top of form, horizontal and vertical tabs, perforation skipover, communications parameters and many other features may be programmed and stored from the keypad.When your system is powered down, the format is retained in memory. The DS180 even remembers the line where you stopped printing. There is no need to reset the top of form, margins, baud rate, etc....it's all stored in the memory. If you need to reconfigure for another application, simply load a new format into the memory.

Communications Versatility—The DS180 offers three interfaces including RS232, current loop and 8-bit parallel. Baud rates from 110-9600 may be selected. A 1K buffer and X-on, X-off handshaking ensure optimum throughput.

Forms Handling Flexibility—Adjustable tractors accommodate forms from 3"-15". The adjustable head can print 6-part forms crisply and clearly making the DS180 ideal for printing multipart invoices and shipping documents. Forms can be fed from the front or the bottom.

If you would like more information on how the DS180's low-cost total printer package can fill your application, give us a call at Datasouth. The DS180 is available for 30-day delivery from our sales/service distributors throughout the U.S.

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3. Are they flexible enough to meet your needs? (Multi-terminal or standalone)
4. Do they offer worldwide service and support?
5. Are their systems fully compatible across their product line?
6. Do they have the resources and commitment to stand by you in the long run? (Office Automation is an evolutionary process.)

Insist on straight answers.

You're investing a lot in Office Automation, learn all you can before making a decision.

For more information write to Mr. Laurie Reeves, Honeywell Office Automation Systems, Three Newton Executive Park Drive, Newton Lower Falls, Massachusetts 02162. Or call (800) 225-3222/3 (within the 617 area, call 552-2048).

Honeywell

'Toss' Throws Office Support To CICS Users

AVON, Conn — Total Office Support System (Toss), a software package for IBM 370, 30 series and 4300 series computers running under CICS, provides personal electronic mail, resource scheduling and task management facilities, according to its vendor, National Business Systems, Inc.

Toss supports IBM 3270-type CRT terminals and printers and allows the integration of different types of word processors and distributed processors.

Features include an electronic mail system with text editing, instantaneous mail delivery, document reviewing and filing facilities; a resource scheduling system that provides facilities for the scheduling of meetings as well as other types of serially used resources; a task management system that provides a means of managing tasks; and Note Processing Facility, which manages user's tickler files as well as other tasks.

The DOS/VS version costs approximately $30,000, the VS1 version costs approximately $51,000 and the MVS version costs approximately $72,000 from National Business Systems, 10 Tower Lane, Avon Park S., Avon, Conn. 06001.

Naval Support Center Battling Staff Cutbacks, Work Increase With Office Automation Study

By Ann Dooley
CW Staff

DALGREN, Va. — With paper flow continually increasing and with a demand from the federal government to cut back on personnel, did John G. Perry, manager at the Naval Surface Weapons Center (NSWC), panic?

No, he automated.

Perry is currently in the midst of a pilot project to determine how much clerical work a proposed office automation system can replace, how much redundancy can be eliminated and how significantly professional staff productivity can be increased. The project was also designed to develop means to measure productivity and develop work flow.

If the pilot proves successful, the techniques will be expanded throughout the organization, according to Perry.

As manager of the Productivity Enhancement Project (PEP) at NSWC, Perry spearheaded the idea of a small office automation prototype that would determine future and more wide-scale needs. To be cost-effective on its own merits, the pilot project will deal with all levels of communications — intraoffice, interoffice and to and from the Washington, D.C. office, 70 miles away. Both offices consist of staff numbering approximately 2,000 people.

Full Size

As many as 300 to 400 applications will be put in place when the project expands to its full size in about two years. It will involve paper flow and communications applications, since, as Perry noted, every major government form has 10 copies. During the next two years, these applications will be phased in graudally, each introduced on the merits of the previous one and based on evidence of cost justification or savings in time or paperwork.

The project will focus on four information flow areas: electronic mail, scheduling, document preparation and a data base with query languages. As many as 100 terminals will be distributed as a sampling base to all levels of staff: secretaries (of whom there are 400), professionals (consisting of research and development staff) and all senior department heads.

The idea for the project began after several departments began requesting standalone word processing equipment. Management thought this was the wrong way to proceed and decided to look into coor-

(Continued on Page 50)

Page Scanner Reads 11 Faces, Interfaces With Ofiswriter II, III

DANBURY, Conn. — The Ofisreader 1240, an optical page scanner that reads 11 different typefaces, has been introduced by the Imaging Systems Division of Burroughs Corp.'s Office Systems Group.

The Ofisreader 1240 reads typefaces such as Courier 72, Prestige Elite and Letter Gothic. It interfaces with Burroughs Ofiswriter II and III series word processors and other vendors' text editing equipment.

The 1240 features three Courier correspondence fonts, four Courier legal fonts, Courier Court Reporter, Prestige Elite, Letter Gothic and OCR-B Standard. Typefaces are chosen using a selector switch on the control panel.

The scanning rate for the 1240 is 300 char./sec, or approximately 250 pages per hour. Scanning accuracy is reportedly less than one error per 10,000 char., according to the firm.

The 1240 interfaces with Burroughs word processors by direct connection and with other editing systems using a communications port and appropriate protocol.

Detecting both vertical and horizontal formats of text, the 1240 recognizes new paragraphs and automatically signals tab positions and accepts columnar material in draft form if more than three spaces are left between columns, according to the vendor.

The Ofisreader 1240 costs $20,900 and rents for $875/mo, plus $130/mo maintenance. More information is available from Burroughs headquarters, Danbury Executive Tower, 30 Main St., Danbury, Conn. 06810.

Ofisreader 1240

Apples Get Message Tools

CUPERTINO, Calif. — Two communications programs, Micro-Courier and Micro-Telegram, have been introduced by Apple Computer, Inc. and Microcom, Inc., the Boston-based developer.

The programs enable an Apple II microcomputer to send many forms of business information from one Apple to another and to access Western Union communications lines.

Previously, an Apple user needed separate word processing software for composing the message, Microcom said.

The packages are the first to include word processing as well as file management and document distribution, the vendor claimed. Instead of needing to send a transmission manually to each intended recipient, the complete message is automatically sent to a preselected list of recipients.

Micro-Courier is intended for users who require overnight or instant exchange of information. It allows an Apple II user to automatically transmit charts, graphs, correspondence, Visicalc reports and entire programs over standard phone lines. Messages can be transmitted locally or nationwide to a time-share data base or to a minicomputer using a standard phone line, the vendor said.

The program can be used to check the status of outgoing mail, to monitor incoming mail and to send a message to as many as 100 recipients. The program automatically redials if the line is busy.

Micro-Telegram allows access to Western Union services worldwide. Apple users can send and receive TWX, Telex and international Telex messages.

The two packages each cost $250 and will be distributed by Apple Computer, Inc., headquartered at 10260 Bandley Drive, Cupertino, Calif. 95014.

Naval Center Automates to Cut Paperwork

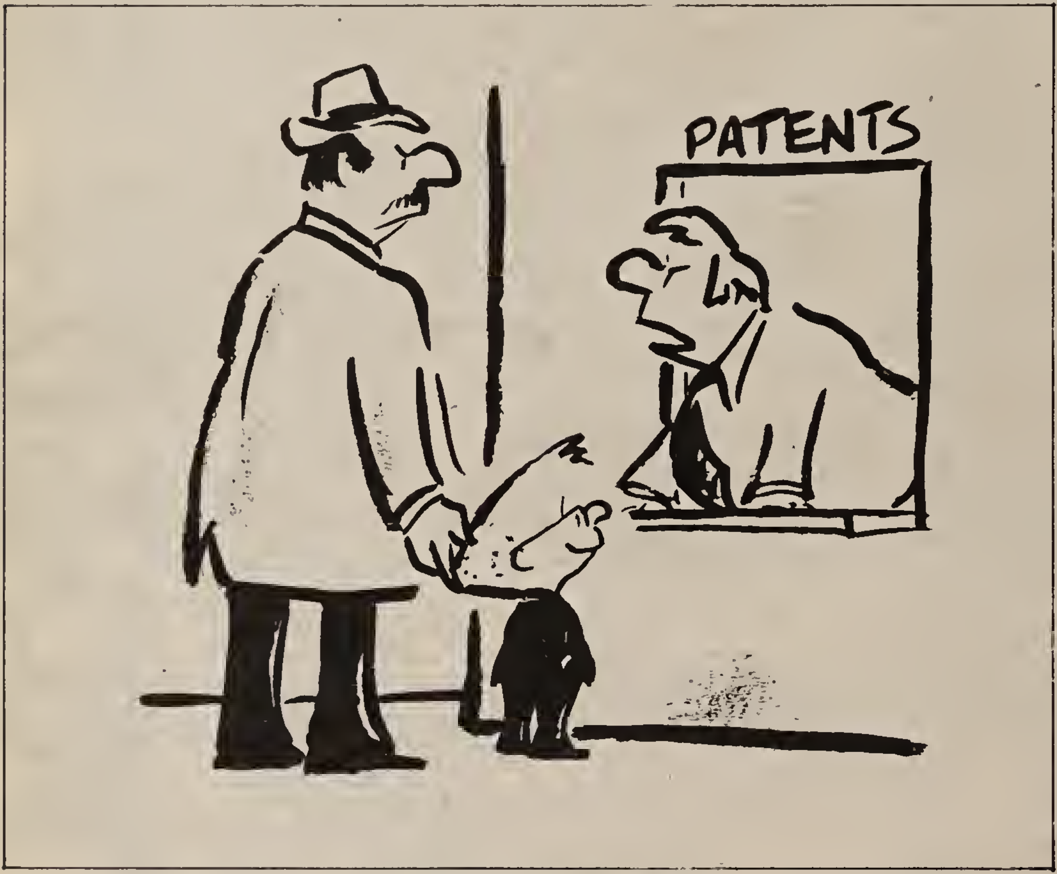
(Continued from Page 49)

dinating compatible equipment growth throughout the organization.

Perry's management requested that his group, the Computer Science Advance Research Group, examine methods of implementing office automation and improving productivity. A project planning group was selected, consisting of a panel of four staff members from different levels and departments: one each from the secretarial, supply, training (human factor) and computer segments of the organization.

Other than Perry, no full-time person was assigned to the planning. "The people you want on a project are usually the best — which also means they're the hardest to get," he noted.

With his management's support, Perry began the project. Throughout the implementation phase and afterwards, measurement techniques will be set up by an outside consulting firm to determine the success of each new procedure. The old techniques will be analyzed for productivity at various levels and then the new techniques, once in place, will be measured and then compared.



'I Don't Care if He Does Have a Brain Like a Computer, You Can't Patent It!'

The project committee selected Prime Computer, Inc. hardware for the pilot project. Three Prime 550-II systems and one 150-II will be connected locally via Prime's Ringnet and connected remotely with the Prime 550-II via Primenet. It will also be linked with the center's other mainframes for further integration.

The project is expected to be on-line by March 1982, although some delay is being caused by lag time in availability of communications lines, Perry said.

Creating a reliable and user-friendly system is also something of a tough job for Perry. "To me, a system being user-friendly isn't as important as it is to the secretaries, for instance," he noted. It is a very important aspect, but it's difficult to get the proper specifications in the system, he explained.

Perry is coming into the office automation environment with a unique background. There are very few computer scientists involved in planning office automation strategies, he noted. Most people have a DP, corporate management or word processing type background and perspective. But coming from advanced research helps one to look at the "big picture," according to Perry.

The NSWC staff is "eager to get their hands on the stuff," Perry noted. Most of the staff has so much work to do — usually of a rudimentary nature — that they want to get rid of as much as they can. "They just don't like paperwork," he said.

The staff is also more sophisticated technically than is the usual organization, he noted. The managers are frequently from a technical background and the secretaries, too, are used to working with highly technical material.

Training will be a joint effort with the Office of Personnel Management to teach management and clerical staff about office automation. Customized training to the user's specific needs will also be given, Perry said.

'Spell Dictionary' Adds 35,000 Words

SILVER SPRING, Md. — Dialcom, Inc. has expanded its Spell Dictionary from 20,000 words to 55,000 words at no extra cost to users.

The Spell Dictionary automatically corrects misspelled words transmitted by the user of a terminal, Dialcom said.

More information on the product can be obtained from Dialcom, Inc. at Suite 410, 1109 Spring St., Silver Spring, Md. 20910.

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Client Accounting System Built for Lawyers by DEC

MAYNARD, Mass. — A Lawyer's Client Accounting System (LCAS) to aid the financial management of law offices and which operates on the Decmate Work Processor system is being introduced by Digital Equipment Corp.

Available through DEC's Computer Stores nationwide, the turnkey unit includes the software package and Decmate unit with one RX02 dual-drive diskette and LA34 desktop matrix printer.

LCAS is also available to current users of DEC's WS78 word/data processor.

The LCAS system accommodates 400 clients and 1,000 matters per year, 9,000 unbilled time and disbursement transactions and 3,000 accounts receivable open items, the vendor said.

Time and disbursements can be tracked, client bills can be generated for legal services and out-of-pocket costs and aged accounts receivable balances can be maintained, escrow and trust account ledgers can be produced and management reports can be generated, according to the vendor.

Management reports can include tabulation for matters treated during the month acccording to each timekeeper, a summary of hours worked and the time value in dollars, as well as a status report on open matters with a client, summarized matter by matter, and a master list of active client names and addresses in several print sequences, according to the vendor.

Prices for LCAS start at $11,795. The firm is headquartered in Maynard, Mass. 01754.

Cybertek Offers Remote Facility

CULVER CITY, Calif. — A remote on-line diagnostic facility for users of Cybertek Computer Products, Inc.'s Information Manager has been announced by the firm.

The Remote Diagnostic Facility is said to enable Cybertek's field engineering department to perform hardware diagnostic testing and software problem analysis via dial-up communications facilities, according to the vendor.

The maintenance tool consists of a communications port and an auto-answer modem at the user site and an intelligent terminal with an auto-dial modem at the Cybertek site, the vendor said.

The user must provide a telephone line adjacent to the Information Manager.

When factory-installed, the facility carries no charge above an $80/mo maintenance fee. If field-installed, the unit costs $500 plus the $80/mo maintenance fee.

Cybertek is located at 6133 Bristol Parkway, Culver City, Calif. 90230.

Survey Lists Mail Systems

CHICAGO — A survey of electronic mail that provides information about 20 computer-based message systems currently available is being offered by Hannagan & Associates.

Focusing on both purchased systems and packages for in-house processing, the survey includes company descriptions, system history, reliability, availability, current user base, system support, analysis of user commands, pricing structure and the comparative advantages and disadvantges.

"The Survey of Electronic Mail Systems" is available for $975 from the consulting firm at Suite 400, 999 Plaza Drive, Schaumburg, Ill. 60195.

Formation Software Automates Insurance Policy Typing

LUVERNE, Minn. — A software package designed to automate the manual policy typing function in insurance companies that use IBM 370 or comparable systems or which run in a Wang Laboratories, Inc. VS environment has been introduced by W.R. Berkley Corp.

Designed by nontechnical personnel in the insurance industry, Formation software is designed for ease of use. It features policy preparation and printing of both computer- and noncomputer-rated policies, word processing capabilities, 100% on-line claims verification, improved productivity of data entry personnel, elimination of the need for hard copy file, reduction in forms and inventory costs, error reduction and microfilm indexing, the vendor said.

Combining data entry and word processing with an on-line inquiry function, forms are set up using a data dictionary as the index of all forms and policies. Users may set up, modify or delete entire forms or portions of forms or they may inquire into any form or policy and print part or all of the information.

The software package costs $25,000 guaranteed, from the firm at One Roundwind Road, Luverne, Minn. 56156.

NRMA National Retail Merchants Association

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Boole & Babbage Sets Up Venture With Israeli Firm

By Robert Batt
CW West Coast Bureau

SUNNYVALE, Calif. — Boole & Babbage, Inc. has set up a joint venture with Israel's largest independent software company to develop and extend its capacity management tools.

The agreement with Advanced Technology Ltd. (ATL) of Tel Aviv is for the development of a work load characterization tool to aid in the management of IBM's IMS. The aim of the joint venture is to develop a product that will allow users to relate their data processing needs to the needs of their businesses.

"Where the growth is in a company affects how you use your computer resources," Judy Quenet, project manager, explained. "The question is, how do you relate business growth with computer resources, since these resources will differ from application to application. It is not a linear relationship and right now the only way to do this is by pencil and paper."

Work Profile

To aid in business planning, Boole & Babbage said, a facility exists to profile work based on data base and user-supplied information — this it calls work load characterization.

Using the product being developed with ATL, Boole & Babbage aims to group information into categories such as account codes, job classes or application projects. The facility would have the ability to relate DP units directly to business units, such as the number of transactions processed vs. the number of components manufactured.

The object is to develop a work load characterization tool that can also access data from other systems running under MVS and CICS as well as IMS. "We are developing this facility with IMS to start with because it is one of IBM's fastest growing areas. Many of our major corporations are committed to IMS and it is becoming increasingly difficult to provide continuous availability of systems without planning tools," Quenet said. IMS licenses worldwide are estimated at more than 1,400.

"To date, we have yet to integrate day-to-day monitoring of operations with short- and long-term planning in a way that can coordinate business planning efforts with computer resources," she added.

Why Israel?

"One of the reasons we chose Israel for the joint venture was because that country has a very high level of trained people and can therefore be used as a resource of programming talent," Quenet said.

In addition, the project has been awarded a grant by the Binational Industrial Research and Development Foundation, set up in 1977 to promote closer economic ties between the U.S. and Israel. This is thought to be the first time the foundation has given a grant for a purely software project.

The aim of the project team, which includes two Israeli systems engineers currently working in Sunnyvale, is to complete the detailed design work within the next six months, followed by an eight- to 12-month period of testing and debugging in Israel.

This Poet's Patent Could Impact Color Graphics

By Marcia Blumenthal
CW Staff

MIAMI — A Florida poet has obtained a patent for a color information display process that could put a cramp on developers of color and color graphics software — unless they want to pay a licensing fee to the inventor.

The U.S. Patent Office granted the patent, No. 4,270,284, in June to Dr. Edmund Skellings, executive director of the International Institute for Creative Communication at Florida International University here. Skellings' patent does not involve software but, if broadly interpreted, it could cover all computer-generated color displays in which two or more alphanumeric characters and/or symbols are color paired to show a relationship.

Moreover, the patent reportedly covers multiple color pairings of alphanumeric characters and symbols and graphics representations.

The professor, who is also the Poet Laureate of Florida, said he has written software to demonstrate his invention. "No one seems to have seen color as a system. Most people developing color graphics software are engineers and mathematicians. I am in the communications industry," Skellings remarked during a recent telephone interview.

Dr. Edmund Skellings

Industry Reaction

Reaction from color graphics software developers was that "he had reinvented the wheel" because some color and color graphics programs already allow color pairing of words and symbols.

This is generally achieved by users selecting various options from a menu displayed on a color terminal. However, the pairing technique to show a relationship is not yet automated into a software system, according to the inventor.

"It is possible to automate the front end of the package that allows individual elements to be color-coded one against the other," Skellings said, noting that current color packages are difficult to use because users have to make so many choices to achieve the desired display.

Agreeing with Skellings on that point was Charles Matheney, chairman of Centec Corp. of Reston, Va., a developer of color graphics software.

"Current packages trade flexibility against ease of use," he explained. The more flexible the package, the harder it is for the user to operate.

Skellings' process, called the Binemic System, evolved from a teaching method he developed in 1958 in which he wrote

(Continued on Page 56)

Plug-Compatible Race Heats Up As IPL Ships on Heels of IBM

WALTHAM, Mass. — Just two months after IBM shipped its first 4341 Group 2 machines, IPL Systems, Inc. has shipped its plug-compatible model of the same processor, the IPL 4446.

IPL President Stephen J. Ippolito claimed this is the first time a plug-compatible manufacturer (PCM) has been able to ship an IBM-compatible machine two months after IBM's first shipment date. Usually, PCMs ship products nine to 12 months after IBM, he noted.

High-End Target

IPL, which entered the end-user PCM market last October and went public last May, is concentrating on the high end of the 4300 market. Market researchers have pegged the 4300 market at 40,000 machines, or $20 billion, over the next five years.

Before IPL entered the end-user PCM market, it had been selling its PCM processors to Control Data Corp. (CDC). Ippolito was not pleased with that arrangement because CDC was selling CPUs primarily to augment its sale of IBM-compatible peripherals.

The high end of the market offers margins not available in the 4331 segment, Ippolito explained. The firm's most established competitor in the 4300 market, Magnuson Computer Systems, Inc., announced a loss in the $2 million range for its most recent quarter, primarily because it was unable to ship its higher end products.

Moreover, Ippolito thinks the 4300 market is all the more healthy now since IBM has raised its prices several times since introducing the series in January of 1979. And PCMs were given a boost recently by IBM when it agreed to make available its System Installation Productivity Options to all licensees of IBM programs regardless of the mainframe installed [CW, June 15].

"If I were playing poker with IBM, I'd say I was dealt four aces," Ippolito quipped.

In the past few months and in 12 cities, IPL has opened direct sales offices that are staffed with 18 sales people and has shipped more than 30 processors to end-user sites, Ronald J. Bleakney, vice-president of sales, noted.

During its last quarter, the firm's mix of end user to OEM sales was about 62% to 38%, Bleakney noted, adding that the firm would like to have end-user sales constitute 75% of its shipments. The major portion of its OEM sales are to Olivetti Corp., which owns 30% of the company.

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The I-9020 is a 16-bit general-purpose single-board minicomputer with main memory of half a megabyte. It features higher reliability, lower noise level and lower power consumption than its predecessor, the I-8200.

The I-9010 table-top 8-bit micro-oriented system offers advanced ergonomic design, multi-language support and communications capability. It is easy to operate and understand.

I-9020

Supershorts

Dr. Thomas Armstrong, director of communications planning at Paradyne Corp., is the holder of a patent issued on June 16 for a device that measures line impairments in data communications networks. The patent, numbered 4,273,955, is titled "In-Service Quantitative Performance Analysis of Data Communications Systems."

— — —

Fujitsu, Ltd. and Hitachi, Ltd. are supporting the SPSS, Inc.'s Batch Systems for use on their M Series IBM plug-compatible hardware, while Nippon Electric Co. will provide SPSS on the Acos Series 300 and larger computers. All of the companies involved will market the Batch System in conjunction with their own hardware.

— — —

Datapoint Corp. has formed an International Operations organization, which will be based in San Antonio, Texas.

— — —

Inmac Corp. is now offering software and computer peripherals in addition to computer accessories, supplies and cables.

— — —

Manufacturing and Consulting Services, Inc. has donated one of its Anvil-4000L software packages to Arizona State University, which will be used in a building and resource expansion plan at the school.

— — —

The Computer and Business Equipment Manufacturers Association has become the first U.S. trade association to endorse the Organization for Economic Cooperation and Development guidelines on the protection of privacy and transborder flow of personal data.

Poet Wins Patent

(Continued from Page 53)

with color chalk on a blackboard to demonstrate to students the relationships between elements of poetry such as alliteration and rhyme.

Patent Application

Skellings applied for the patent for the display process in 1978. He said that process is based upon the correspondence between the red, green and blue cones in the retina of the human eye from which all other colors are derived and the corresponding planes of the color CRT terminal.

Although the patent was granted as an information display to teach "linguistic, literary and/or stylistic features of language," Skellings said he intends to pursue broader applications for the patent such as word processing and standard management information systems applications.

He has filed for additional patents to cover what he termed "loopholes" in the original patent application and has applied for patents in Japan, the UK and Canada, he said.

Licensing Arrangements

Skellings claimed he already has a licensing arrangement with Ramtek Corp. and is in negotiations for licensing agreements with Tektronix, Inc. and Xerox Corp. Moreover, he said, IBM, Apple Computer, Inc. and Control Data Corp. are studying the patent.

Some of these companies have loaned Skellings equipment to demonstrate his techniques and have known about his activities for some time. The International Institute for Creative Communication, out of which Skellings works, is a consortium of nine state colleges and has a 40-member faculty.

While people at Ramtek and Xerox know Skellings, referring to him as colorful and engaging and a highly original thinker, spokesmen for those companies said they were not aware of any licensing agreements or negotiations.

Skellings, who was described by one person as a character out of *The Music Man*, first demonstrated the computer applicability of his invention at the National Educational Computer Conference in 1979, using equipment from Ramtek, Xerox and Tektronix, among others.

To date, no one has challenged the validity of his patent. "That's for the courts to decide," Skellings said.

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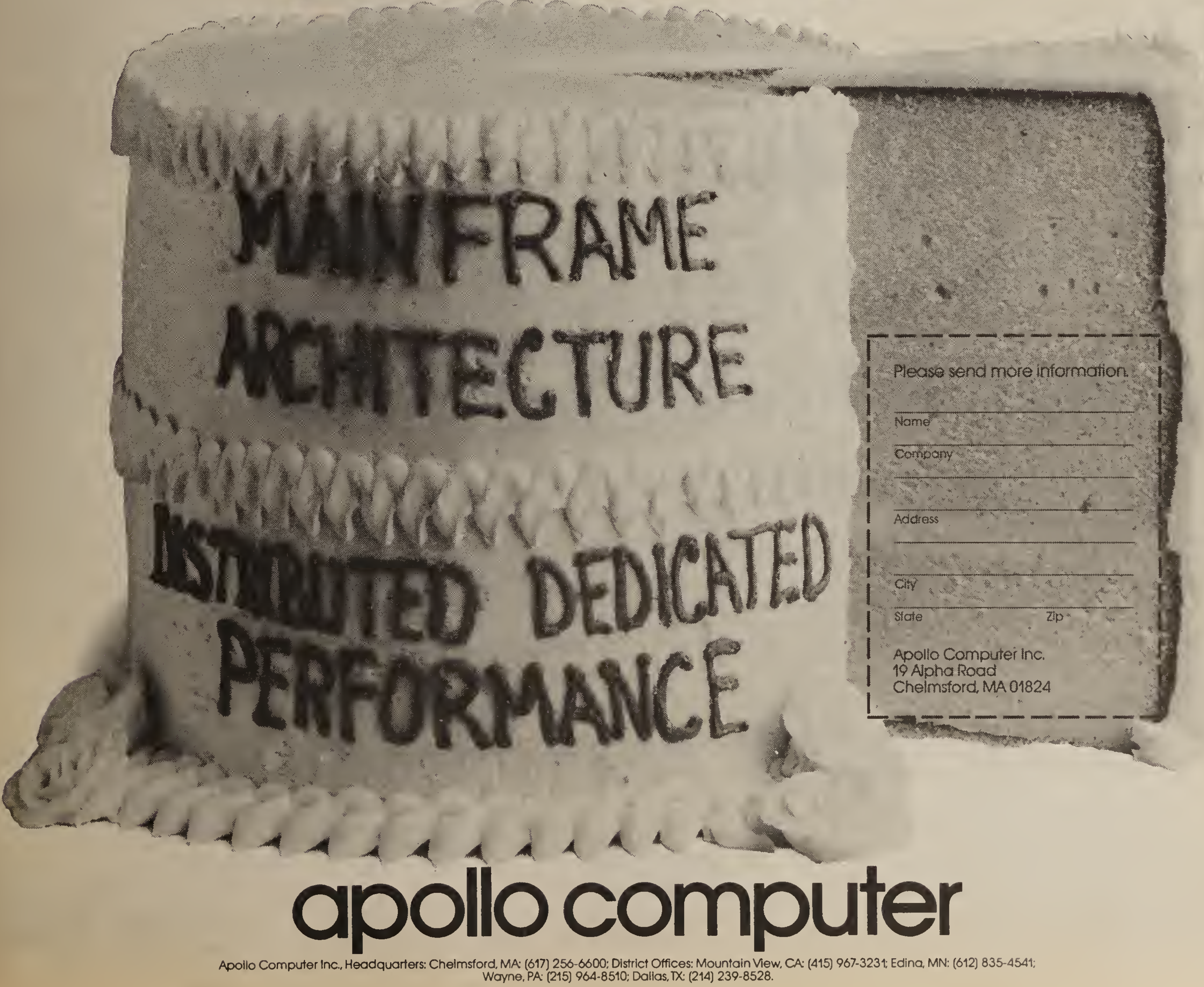

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Semi Slump Cause Two Firms to Cut Back

By **Marcia Blumenthal**
CW Staff

A slump in the semiconductor industry and a slowdown in the European economy are causing layoffs or work reductions in two computer-related firms.

Tektronix, Inc., which reduced its total number of employees by 600 both by attrition and layoffs during its fourth quarter ended this past May, said its ongoing cost-cutting measures could result in further layoffs of employees.

"Although customer orders are up from last year, we're going to continue with our aggressive cost-cutting plans. The order rate is still not high enough to support the existing expense level," Earl Wantland, president, said.

Because of the slow recovery of the European economy, Tektronix recently sent letters to its 20,000 U.S. employees advising them of possible layoffs.

Since the firm began cost-cutting measures several months ago, 400 employees displaced by the elimination of certain company programs have been reassigned to other parts of the firm's operation. The streamlining measures have been across all the company's activities, a spokeswoman noted.

No further layoffs have yet been made and any termination notices will be made gradually. Employees terminated will receive at least four-weeks' pay in lieu of notice, the firm said.

At National Semiconductor Corp. (NSC), employees in semiconductor operations had their work schedules reduced two days this month. Their schedules will be reduced by two days in September and by four days in December.

"This is in keeping with the company's no-layoff policy," Charles E. Sporck, NSC's president and chief executive officer, said.

Sporck further said the firm's sharply reduced bookings and prices in Europe, aggravated by foreign exchange rates and price competition across several product lines, will result in a significant reduction in its first-quarter fiscal 1982 earnings than in the same period a year ago. That quarter ends Sept. 29.

Nickels & Dimes

Amperif Corp. has secured $1 million in additional financing through equity funds invested by Continental Illinois Venture Corp., an affiliate of Continental Bank of Chicago, Ill.

$$$

Britton-Lee, Inc. has completed its third phase financing with equity funding of $3.3 million from a group of English and Scottish financial institutions. The money will be used to complete full-scale production facilities and establish distribution and service networks.

$$$

Corvus Systems, Inc. has filed a registration statement with the Securities and Exchange Commission for a proposed public offering of two million shares of its common stock.

$$$

Solid State Technology, Inc. has announced that its long-term financing plans coupled with the restructuring of its corporate debt have been delayed due to general market conditions, but its short-term financing has been completed. The new financing will be used primarily to market and produce the company's desktop line of microcomputers.

$$$

Wespercorp, Inc. has filed with the Securities and Exchange Commission a registration statement covering a proposed public offering of 434,000 shares of common stock.

$$$

Ask Computer Systems, Inc. has filed a registration statement with the Securities and Exchange Commission covering an initial registered public offering of 1.35 million shares of its common stock.

$$$

Synercom Technology, Inc. has closed on a private placement of its preferred stock in the amount of $4,000,000 to a group of venture capital and institutional investors led by Adler & Co.

$$$

Electronic Data Systems Corp. has declared a quarterly cash dividend of .15 per share of common stock to be paid on Sept. 1 to stockholders of record on Aug. 14. The company's common stock was split two-for-one effective June 29.

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Docutel Corp. has completed its purchase of the assets of Olivetti Corp.'s financial systems in the U.S. The company paid a wholly owned Olivetti subsidiary the agreed upon 368,750 newly issued Docutel shares, as adjusted to reflect the company's March stock split.

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Quantitative Technology Corp. is a new consulting firm specializing in computer software for the science and engineering community. The firm is headquartered at 10170 S.W. Nimbus, Portland, Ore. 97223.

Performance Software, Inc. is a new company that markets and develops software products in business applications, programmer productivity tools, on-line data entry and on-line data query for users of the Univac Series 90 and 80 systems. The company is located at 1009 Sycamore Square, Midlothian, Va. 23113.

Telemation Associates, Inc. has been formed to provide strategic planning and consulting services in telecommunications and information policy to U.S. and international clients. The firm is located at 1015 18th St. N.W., Washington, D.C. 20036.

PLT Engineering, Inc. has announced the formation of a new division, **Integrated Graphics Services**, which will provide computer-aided drafting and design services as well as consulting, training, contract operation and maintenance for other companies that purchase or lease computer graphics equipment. The company is located at Suite 600, 1160 Dairy Ashford, Houston, Texas. 77079.

Raster Technologies, Inc. is a new company that has been formed to manufacture and market high-performance graphics display products for computer-aided design and manufacturing and computer imaging applications. The company is located at 110 Eighth St., New York, N.Y. 12181.

Technical Support Corp. is a new information management consulting firm specializing in providing technical support consultants to clients. The firm can be reached through P.O. Box 5139, Westport, Conn. 06880.

Bunton, Peace & Associates, Inc. is a marketing and management consulting firm specializing in data processing. The company is located at Suite 107, 17 Dunwoody Park, Atlanta, Ga. 30338.

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- George I. Doering has been promoted to vice-president and general manager of Apache Control Systems Division, a subsidiary of National Can Corp.
- John E. M. Gardner has been named controller of the business and field divisions at Data General Corp.
- Mohawk Data Sciences has appointed Kenneth E. James to the position of vice-president of human resources.
- Jack Foster has been promoted to vice-president of sales for Fujitsu Microelectronics, Inc.
- Art Stabenow has been appointed vice-president of the Semiconductor Division and group director of linear integrated circuits at National Semiconductor Corp.
- Charles W. Swan Jr. has joined Forward Technology, Inc. as vice-president of finance and administration.
- Chris Carlton has been promoted to the new position of vice-president of personnel at Shugart Associates, Inc.
- Bruce T. Coleman has been named executive vice-president of operations and Richard C. Lemons has been named a senior vice-president at Informatics, Inc.
- Jack Person has been appointed vice-president of marketing and sales and Richard Songer has been appointed vice-president of customer services at Display Data Corp.
- Joel R. Alper has been appointed vice-president of communications services at the Comsat World Systems Division of Communications Satellite Corp.
- Robert L. Sikora has been elected to the board of directors and will serve as senior vice-president of finance and administration at Novell Data Systems, Inc.
- Frank J. Finelli has been appointed vice-president and chief financial officer at Advanced Electronics Design, Inc.
- Robert J. Brown has been appointed vice-president of marketing at Comdial Telecommunications, Inc.
- Richard W. Walliser has been appointed vice-president of finance and administration and Robert J. Beese has been named vice-president of marketing at Alphacom, Inc.
- Thomas S. McCaffrey has been appointed to the newly created position of vice-president of the Industry Systems Group, the Americas Division; and Stuart J. Miller has been promoted to the new position of vice-president and general manager of office information systems at Sperry Univac, a division of the Sperry Corp.
- Wade H. McCree Jr. has been elected to the board of directors at Burroughs Corp.
- James R. Keener has been promoted to vice-president of sales and marketing and Irwin Pfister has been appointed vice-president of engineering at the Industrial Products Division of Computer Automation, Inc.
- Marc S. Seriff has been appointed vice-president of quality management at GTE Telenet Communications Corp.
- James R. Bonin has joined Mini Computer Software Specialists, Inc. as executive vice-president of sales and marketing.
- Jon F. Kropper and Frederick A. Wang have been elected senior vice-presidents and officers at Wang Laboratories, Inc.
- Micromation, Inc. has named Calvin M. Dyer to the new post of chief financial officer and William H. McIntyre as director of operations.
- Andre O. Schwager has been named general manager of the newly formed Information Networks Division, Milton I. Liebhaber has been named general manager of the newly consolidated computer applications systems activities and Edward J. Hayes has become marketing manager of the Business Computer Group at Hewlett-Packard Co.
- Ira M. Lubert has joined Business Communications Systems, a division of ITT Courier Terminal Systems, Inc., as vice-president of U.S. sales.
- Christopher Duffy has been appointed vice-president and chief administrative officer at Anacomp, Inc.
- Philip F. Otto has been appointed president of Telco Systems, Inc.
- William R. Brown, a former Xerox division president, has been elected chairman and chief executive officer of ICS Group, Inc.
- James D. Lindner has been named president of Exxon Office Systems, International S.A., an affiliate of Exxon Office Systems Co.
- Robert J. Ford has been promoted to vice-president of engineering at Boole & Babbage, Inc.
- Thomas H. Elrod has been named to the newly created position of executive vice-president at Micro Five Corp.
- Joseph G. Degen is the new vice-president of finance and administration at Nixdorf Computer Corp.
- Robert M. Allen has been appointed executive vice-president of National Advanced Systems, a wholly owned sudsidiary of National Semiconductor Corp.
- BDS Corp. has named Timothy J. Franey vice-president of operations for its complete product line.
- Ivo Adam has been named executive vice-president of the newly formed Cynthia Peripheral Corp., a sudsidiary of CII Honeywell Bull.
- Ralph Johnson has been named to the new position of executive vice-president at Cylix Communications Network, an affiliate of Data Communications Corp.
- Ed Costa has been named vice-president of Basic Dimensions, Inc.
- Gesco Corp. has restructured internally and reassigned the following people: Rod Moser, Charles Yeats, Carlos Raval, Neal Lehman and Charles Stoneburg have all become senior vice-presidents.

Computers help kids choose careers and destroy Klingons — this week on "Computerworld".

In Massachusetts high schools, an interactive computer system lets kids compare their interests and talents to a variety of different careers to help them make better choices about their futures. Guidance counselors, students and teachers think the system is very effective. "Computerworld" shows you how it works.

Meanwhile, in game rooms across the country kids (and adults, too!) find themselves becoming addicted to the new, computerized games. Watch the good guys clobber the bad guys, and see what people find so fascinating about these new machines.

All this and more, this week on "Computerworld."

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Washington, DC	WDCA	20	Saturday	12:00 Mid.
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Dallas/Ft Worth	KNBN	33	Saturday	12:30 PM
Detroit	WXON	20	Saturday	10:00 AM
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Whether you're actively involved with computers or just interested in the latest happenings in the computer revolution, you and your family will enjoy and benefit from "Computerworld."

Courses Tackle Management Skills

Firm Set to Teach Business a Lesson — in CAI

By Robert Batt
CW West Coast Bureau

PALO ALTO, Calif. — With the demands on data processing professionals increasing as managers strive for better productivity gains, computer-aided instruction (CAI) is coming more into its own as a useful management tool.

Computer Curriculum Corp. (CCC) is a small, privately owned company that is attempting to take advantage of this growing marketplace, offering its computer-assisted instructional system to provide courses in business skills.

The company claims its latest system, the CCC-17 — which uses the Data General Corp. Nova with up to 64K bytes of memory and 30M bytes of disk technology — can support up to 96 terminals and 5,000 students simultaneously.

CCC recently got involved with Teletel, the French telephone system, using CCC-17 to provide instructional material over that network.

According to Patrick Suppes, CCC president, "The increasingly technical nature of industry requires more efficient and technical means of training people. There is an increasing recognition by managers of the high cost of training, particularly in terms of manpower costs, and so there is a great need to do it as effectively as possible."

Three Sources

CCC believes there are three potential. sources of business for its CAI systems:

- Companies with large numbers of people doing technical work and who require better basic skills.
- Companies with a significant number of employees who need more training in English because of its importance as the primary language of international businessmen.
- Firms that want specific technical training. "We are prepared to use our system to train people in highly technical subjects. For example, if an oil company wanted an introductory course in geophysics for its staff, we would be prepared to teach such a course using the computer as the primary tool of instruction. We would be able to examine the students on the basic ideas of the material presented," Suppes claimed.

The company sees a big demand for services such as these, with revenues currently standing at around $20 million and expected to grow at an annual compound growth rate of between 20% and 30%.

"Until recently, we have not done any marketing of our products in the industrial sphere, concentrating primarily on academic institutions instead. But now we are planning to carry out customized training programs to meet the needs of individual companies and we expect to be a much more aggressive competitor in this market from now on," Suppes added.

This new aggressive posture will not come easily to a company that for more than 10 years has rested snugly in its position as virtually the only supplier of CAI systems to the education market.

Now with cutbacks in public expenditure expected to affect that market, the company needs to branch out. In so doing, it will run into tough competition from firms such as Control Data Corp. and various microcomputer and publishing companies.

In an attempt to establish a firm market base, CCC is concentrating heavily on the overseas market where computers are being used to teach English as a second language. CCC recently set up a joint venture in France with Compagnie Generale d'Informatique (CGI).

Through the venture, known as Didao, CCC provides the CAI systems while CGI develops the curricula. CCC also has opened sales networks in Canada, the Far East, Mexico and Italy. "We see a lot of our business coming from overseas," Suppes said.

In developing curriculum material to service the needs of business, CCC places heavy emphasis on quality software, with all its systems running in Assembly language.

According to CCC, individual instruction is achieved as the computer monitors each student's progress — for example, checking on the student's grasp of a particular concept and analyzing student responses to questions.

An example of the complexity of software required can be gauged from CCC's assertion that curricula such as audio reading require up to 30,000 different sounds in order for the student to learn English with the aid of a computer.

According to Rainer Schulz, CCC vice-president, "This requires an enormous amount of software development, but we expect to be firmly established in the business market by 1982."

Given the high costs of development, which are partly offset by government funds, CAI systems are not cheap, with a typical CCC installation costing the end user between $130,000 and $150,000.

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Contracts & Pacts

E-O Data Corp. has signed a contract with Rixon, Inc. to distribute that company's line of modems, multiplexers and related data communications products.

Zilog Corp. and Advanced Micro Devices, Inc. (AMD) have signed a letter of intent for a licensing agreement under which AMD will manufacture and market a new 32-bit microprocessor being developed by Zilog Corp.

Minicom Systems, Inc. has renewed its contract with Topaz Electronics, a division of Topaz, Inc., to purchase Line 2 power conditioners over a one-year period.

Tandem Computers, Inc. has awarded Kennedy Co. a $7 million, two-year contract for Model 9300 vacuum-column and Model 9000 tension-arm tape transports to be used in Tandem's multiprocessor on-line transaction processing systems.

New World Computer Co. has received a major order from Kanematsu-Gosho, (U.S.A.) Inc. for 5,000 units of the 5¼ memory disk units, valued at $3,625,000.

Computer Sciences Corp. has received a $5 million contract from the U.S. Army's Computer Systems Selection & Evaluation Agency for the initial phase of Project Viable, a program that will upgrade the Army's base support systems.

Computer Systems Division of Harris Corp. has entered into an agreement with Megatek Corp. that will enable Harris to purchase Megatek's full line of graphics terminals and Wand, a device-dependent software.

Burroughs Corp.'s Text Management Division has awarded a contract to Diablo Systems, Inc. for Model 630 daisywheel letter-quality printers.

Southern Systems, Inc. has signed a contract to purchase approximately $6 million in OEM line printers from Control Data Corp.

Okidata Corp. has announced it will provide on-site maintenance for its Slimline series of printers in 12 major areas throughout the continental U.S. The San Francisco and Philadelphia areas will be serviced by Okidata's own depots in Santa Clara, Calif., and Mount Laurel, N.J., and the Customer Service Division of Decision Data Computer Corp. will service end users in Boston, New York, Atlanta, Miami, Chicago, Minneapolis, Dallas, Houston, Los Angeles and Orange County, Calif.

California Devices, Inc. (CDI) and Logic Corp. (LSI) have signed a technology exchange agreement whereby CDI obtains access to LSI's advanced design automation system and LSI obtains certain rights to manufacture and sell CDI's Cmos gate array designs.

Honeywell Inc.'s Systems and Research Center has been awarded a $19,800,000 contract by the U.S. Air Force for development of the next generation of integrated circuits under the Department of Defense's Very High-Speed Integrated Circuits program.

Metasoft Corp. has entered into a contract to supply its Benchmark software to Harris Corp.'s Data Communications Division for use on the 1600 and 9200 series computers.

Evolution Computer Systems Corp. (ECS) has paid the balance of its $1,550,000 purchase note to Pick and Associates, Inc., which was used to finance the purchase of Evolution's computer product line, inventories, field service base and long-term software license. In addition, ECS and Eversoft, Inc. have jointly announced a new Solution/Four software package, which will provide a performance upgrade to Basic Four users, and a major agreement has been reached for ECS to market Systems Management, Inc.'s business and management control software.

The U.S. Department of Energy has signed a contract with Dialcom, Inc. for the company to provide approximately 100 electronic mailboxes to be used in the department's Energy Emergency Management Office.

California Computer Systems, Inc. (CCS) has signed an agreement with Graham Dorian, a division of FMG, Inc. to distribute Graham Dorian software with the CCS line of S-100 systems.

Structured Systems Group, Inc. (SSG) has signed an agreement with Sharp Computer Corp. to supply SSG business programs for Sharp's new XY-3200 computer system.

Amtel Systems Corp. has signed a multimillion dollar, long-term product development and manufacturing agreement with Specialized Systems, Inc. (SSI), under which Amtel will design, develop and manufacture a series of low cost, intra-office communications products to be marketed by SSI under the trade name Executel.

Computer Sciences Corp. has been selected by the National Aeronautics and Space Administration for a contract valued at $8.5 million to provide the applications software support system for the Space Telescope's payload operations control center. The satellite will be launched by the Space Shuttle in 1985.

Minicom Systems, Inc. has renewed its contract to purchase 1,000 CRT terminals over a one-year period from Soroc Technology, Inc.

Cromemco, Inc. and American Computers and Engineers, Inc. (ACE) have signed a contract in excess of $2 million for Cromemco to provide ACE with multiuser, multitasking Cromix computer systems.

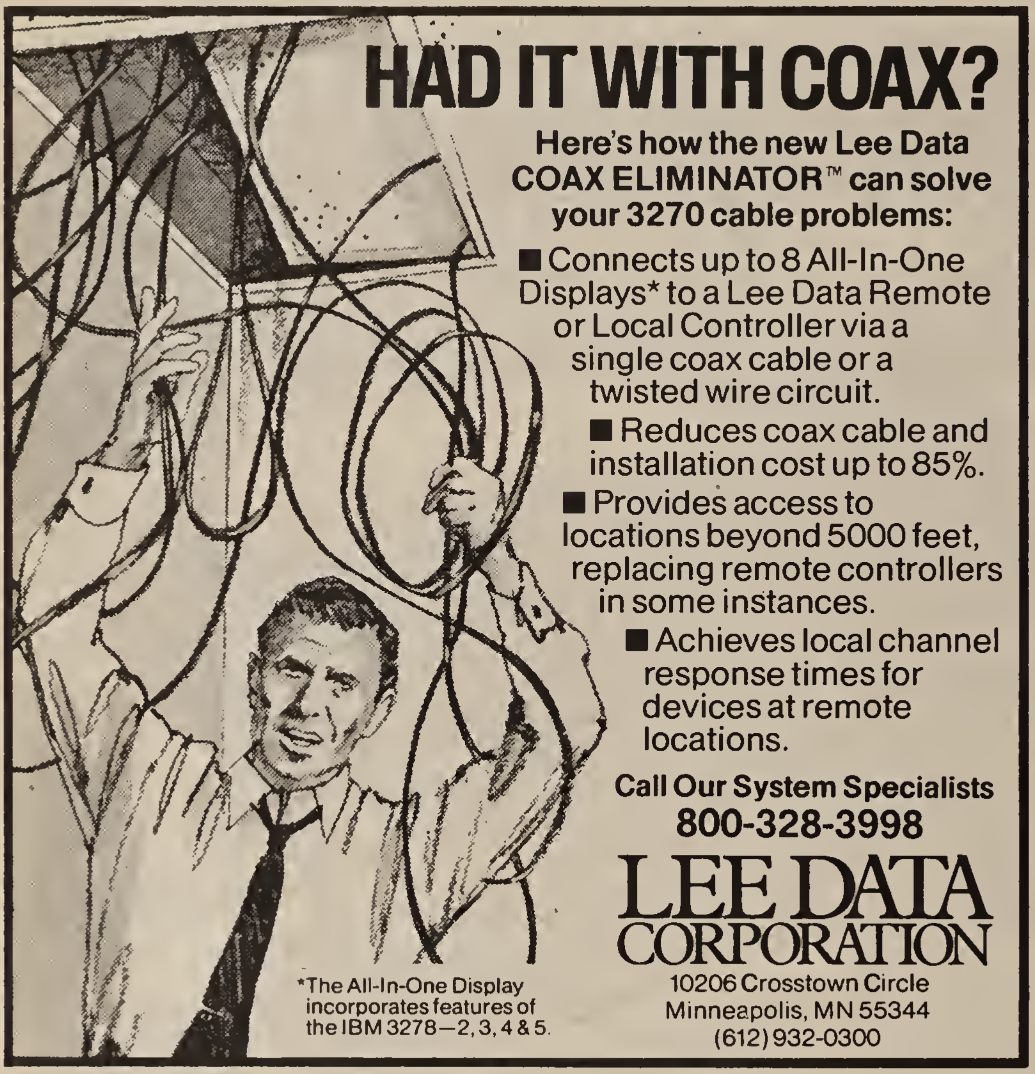
The Naval Surface Weapons Center (NSWC) will use Prime Computer, Inc. systems, estimated to cost more than $1 million, in a prototype office automation program. The Productivity Enhancement Project studies will help NSWC determine how much clerical work the system can replace, how much redundancy can be eliminated and how professional staff productivity can be increased.

Planning Research Corp. has been awarded a 2½ -year contract with a potential value of $2 million to provide computer programming for the automated telecommunications systems in the Pentagon Telecommunications Center, which provides message processing for the U.S. military in the continental U.S.

Lexicon Corp. has entered into a purchase agreement with Sperry Univac, a division of Sperry Corp., for 1,000 LEX-12 modems to be delivered over the next 12 months.

Datastream Communications, Inc. has recently signed a three-year contract valued at more than $3 million with Anderson Jacobson, Inc. to supply Datastream T7CM network access communications systems.

Touche Ross and Co. has signed an agreement to license the Pansophic Systems, Inc. products, Easytrieve and Panaudit, for use in Australia.



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Contracts & Pacts

Apple Computer, Inc. and Southwestern Publishing Co. have joined in a cooperative effort to develop business-educational software packages.

The Naval Surface Weapons Center (NSWC) will use Prime Computer, Inc. systems, estimated to cost more than $1 million, in a prototype office automation program. The Productivity Enhancement Project studies will help NSWC determine how much clerical work the system can replace, how much redundancy can be eliminated and how professional staff productivity can be increased.

Planning Research Corp. has been awarded a two and a half-year contract with a potential value of $2 million to provide computer programming for the automated telecommunications systems in the Pentagon Telecommunications Center, which provides message processing for the U.S. military in the continental U.S.

Lexicon Corp. has entered into a purchase agreement with Sperry Univac for 1,000 LEX-12 modems to be delivered over the next 12 months.

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Touche Ross and Co. has signed an agreement to license the Pansophic Systems, Inc. products, Easytrieve and Panaudit, for use in Australia.

Control Data Corp. has received a major OEM contract valued at approximately $5.6 million from Southern Systems, Inc. to supply the firm with its E-series band printers.

Compucorp, Inc. has been awarded a multiyear contract by the Library of Congress, Washington, D.C., for the installation of word processing systems of varying configurations.

Gnat Computers, Inc. has signed a major distribution agreement with American Peripheral Systems, Inc. that provides for American to purchase approximately $12 million worth of Gnat microcomputer systems over a five-year period.

Logicon, Inc. has received a $17.2 million extension from the U.S. Air Force Ballistic Missile Office to expand its participation in development of the MX intercontinental ballistic missile system.

Intel Corp. and Harris Corp. have entered into a technology exchange agreement for the design of complementary MOS microprocessors and peripherals.

Application Development Systems, Inc. has recently been awarded two contracts to develop and implement a court information system for the Superior Courts of Ventura County and a juvenile justice information system for the Superior Courts of San Bernardino County.

Harris Corp.'s Data Communications Division has installed more than 80 distributed data processing systems in the U.S. Department of Agriculture's (USDA) offices across the country as part of an agreement that could total $7 million. It allows USDA an option to lease as many as 118 Harris 1650 systems.

Advanced Micro Devices, Inc. of Sunnyvale, Calif., and Mostek Corp. of Carrolton, Texas, have completed negotiations for a joint agreement to develop and produce microelectronic components that will be used to provide communications capability for information systems utilizing Ethernet.

Western Business Computers has signed an agreement with Honeywell, Inc. for full marketing and service rights to the Honeywell DPS-6 small business computer over the next five years. This update agreement to a $250 million marketing contract is the largest such marketing agreement in Honeywell's history.

Tau-Tron, Inc. has received orders from Western Electric Co. for nearly half a million dollars worth of test sets for digital transmission systems.

Data Printer Corp. has signed a multiyear contract estimated at $25 million for its Model 3601 band line printer with West Germany-based Siemens AG.

Associated Computer Consultants, Inc. announced that two of its protocol handling devices have been selected by Ecom prime contractor RCA Corp.

Four-Phase Systems, Inc. of Cupertino, Calif., and National CSS, Inc. (NCSS) of Wilton, Conn., have concluded an OEM purchase agreement and a separate hardware maintenance agreement. Under the terms of the four-year OEM pact, Four-Phase will supply National CSS with System 311 and 312 computers. Four-Phase has also contracted to serve as National CSS' entire hardware maintenance operation for both existing and new NCSS 3200 systems.

Vector Graphic, Inc. has signed a contract with the General Services Administration covering sales of its microcomputer word and data processing systems and software to federal agencies and their contractors.

Information Retrieval Systems Corp. (IRSC) and Fiducia Datenverabeitung of the Federal Republic of Germany have agreed through a letter of intent on the formation of a joint venture to market IRSC information management systems in Europe.

Kennedy Co., a subsidiary of Magnetics & Electronics, Inc., has signed a $1 million, two-year contract with Tymshare, Inc. to provide Tymshare with Kennedy Model 5300 Winchester disk drives and Model 9000, 9100 and 9300 tape transports for use in its minicomputer systems.

The U.S. Army Corps of Engineers has signed a contract with the Computer Systems Division of Harris Corp. valued at $7.4 million for 21 Harris 500 superminicomputer systems with Vulcan operating system software, documentation, training and maintenance during fiscal year 1982.

The Perkin-Elmer Corp. has been awarded a major contract by Geosource, Inc. to provide a quantity of its high-performance Model 3240 32-bit superminicomputers to be used as the basis for Geosource's ultra high-performance Tempus 32 seismic data processing systems.

Cullinane Database Systems, Inc. has signed an agreement with The Arben Group, Inc. for that company to produce video-based education courses for Cullinane data base and audit retrieval products.

Sanders Associates, Inc. has been awarded $4.1 million in contracts from IBM's Federal Systems Division to provide Graphic 8 color display terminals, support software and services for two Air Force programs: Data Systems Modernization and the Global Positioning System.

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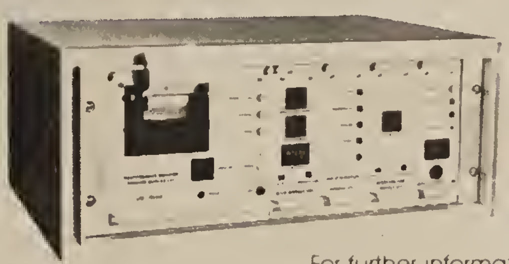

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Expansions

Atlantic Data Services, Inc. has announced plans to relocate its Boston office to the new Batterymarch Office Park, Quincy, Mass.

Data General Corp. has purchased the former Annhurst College property in Woodstock, Conn., to be used as a training center for the company's Field Engineering Division.

Quay Corp. has recently moved into a new 28,000-sq-ft facility located at 527 Industrial Way W., Eatontown, N.J. 07724.

Octal, Inc. has expanded its staff and relocated to a 2,400-sq-ft facility at Suite P, 1951 Colony St., Mountain View, Calif. 94303.

Micromation, Inc. has moved its computer manufacturing and production operations into a 40,000-sq-ft facility located at 165 Eighth St., San Francisco, Calif. 94112.

Apollo Computer, Inc. has moved its corporate headquarters to 19 Alpha Road, Chelmsford, Mass. 01824

Tandem Computers, Inc. has begun construction on a new 140,000-sq-ft facility adjacent to the company's headquarters that will house corporate administration headquarters, marketing, technical training and support personnel.

Electronic Arrays, Inc., a division of NEC Electronics U.S.A., will build a major facility with 120,000 sq ft of floor space on 75 acres north of Roseville, Calif., for the manufacture of very large-scale integrated circuits.

Anacomp, Inc. plans to expand the company's facilities in Sarasota, Fla., Bellevue, Wash., and Columbus, Ohio.

New World Computer Co. will be moving its headquarters and production facilities to a 21,800-sq-ft building located at 2805 McGaw Ave., Irvine, Calif. 92714.

Nixdorf Computer Corp. has leased 23,154 sq ft of space for use as company headquarters for branch operations of sales, software and engineering. The new location is at 204 Second Ave., Waltham, Mass. 02154.

Fedder Software Systems, a division of Interactive Computer Systems, Inc., has moved to new quarters located at Suite 212, 6707 Whiteside Road, Baltimore, Md. 21207.

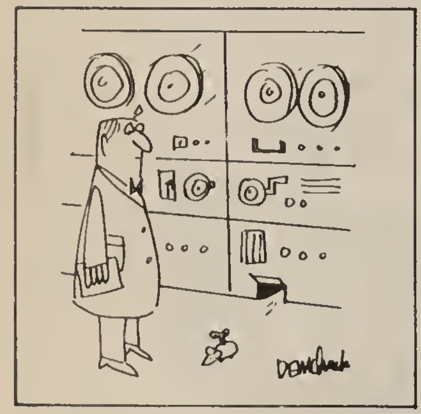
Motorola, Inc. has announced a $120 million expansion of its semiconductor facility in East Kilbride, Scotland.

Cray Laboratories, Inc. has opened and dedicated its new 30,000-sq-ft research and development facility in Boulder, Colo.

CPT Corp. has broken ground for a 150,000-sq-ft manufacturing facility in Chanhassen, Minn., with an anticipated completion date of early 1982.

Kikusui International Corp. has moved its corporate offices to a new 15,000-sq-ft facility located at 17819 S. Fugueroa, Gardena, Calif. 90248.

Mathews & Company has doubled the size of its headquarters in a move to 36 Old Kings Highway S., Darien, Conn. 06820



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Adapso Sets September Sessions On Mergers, Legal Management

ARLINGTON, Va. — The Association of Data Processing Service Organizations, Inc. (Adapso) is offering seminars on mergers and acquisitions and on legal management in New York Sept. 16 and 17, respectively.

"Mergers and Acquisitions" will cover developing acquisition criteria; how to select, evaluate and determine a company's potential; and the positive and negative factors involved in acquisitions.

"Legal Management" will include techniques such as how to manage legal counsel and everyday legal matters, contracts, software protection, business liability and litigation.

The registration fee for Adapso members is $175 for each and $250 each for nonmembers.

There is a $50 discount for companies participating in both programs, Adapso said from Suite 300, 1300 North St., Arlington, Va. 22209.

Mergers/ Acquisitions

Continental Computer Leasing Corp. has purchased all of the stock of **Associated Computer Investors, Inc.**, which has been renamed Continental Computer Leasing Corp. of Illinois in a transaction valued at $850,000. Terms include payment of cash at time of sale, assumption of existing debt and installment payments over a three-year period.

TRW, Inc. has announced the sale to **Datapoint Corp.** of its interests in eight international distributor organizations that sell Datapoint products and its rights under a master distributorship agreement with Datapoint for sale of Datapoint products abroad. Proceeds to TRW from the sale were approximately $68 million, with the after tax gain estimated to be approximately $33 million or about 88 cents per fully diluted common share.

Logica, Inc. will merge its operations with those of **Freyberg Systems Associates, Inc.**, a services outfit specializing in banking communications. The company will continue to be known as Logica, Inc. and will have offices in New York, Boston, San Francisco and Washington, D.C.

The Standard Register Co. has agreed to purchase **Unique Graphics Corp.** of Terre Haute, Ind., for an undisclosed amount of cash.

Data-Design Laboratories' subsidiary, **United Scientific Corp.**, has acquired the assets of **Logic Systems, Inc.** of Santa Clara, Calif.

Our widely accepted *UNIX*™ operating system is simplifying the use of computers. Designed to handle a variety of applications, it is being used to manage and maintain the telecommunications network, control experiments, develop software, process text, prepare documents, and teach computer science.

The *UNIX* system allows users to take small programs and assemble them like building blocks to perform complex tasks. In text processing, for example, the command "Spell Bell Labs Ad" tells a computer to proofread this ad against a dictionary filed in its memory. The program that performs the task was created by simply combining several smaller *UNIX* programs.

Another useful feature of our *UNIX* operating system is its ease in typesetting mathematical expressions. To typeset an equation like

$$\sum_{i=1}^{\infty} \frac{1}{x_i} = \pi$$

someone need only type: "Sum from i=1 to infinity 1 over x sub i=pi." The computer does everything else.

Since 1969 the Bell System has installed more than 1100 *UNIX* systems. Along with other Bell Labs innovations in computing technology, these systems are enhancing the way the nation's telecommunications network is planned, designed, built, and operated. Through licensing agreements with Western Electric, universities have installed over 800 *UNIX* systems, and government and industrial facilities are using over 400.

The *UNIX* operating system can be used with computers of different manufacturers because it is small, cleanly designed, and written in a general-purpose programming language. Such portability in a computer operating system saves time and money.

Building on the past

The *UNIX* system is just one of many Bell Labs advances in computing science and technology over the years. Among our innovations:

- Application of telephone switching concepts and technology to early computers
- First demonstration of remote computer terminal and data link
- Conception of electronic analog computer
- First design of AND and OR gates for diode circuitry
- Formulation of Information Theory
- Invention of error-detecting and error-correcting codes
- Demonstration of first general-purpose transistorized digital computer
- Development of computer operating systems
- Design of computer languages, including ALTRAN, SNOBOL, L6, and C
- Creation of computer graphics techniques for storing, manipulating, and presenting information
- Development of Fast Fourier Transform
- Design of central processors for switching systems having virtually no downtime

Looking ahead

Computing technology is having a major impact on the telecommunications business. It's increasing the Bell System's ability to provide new services and handle existing ones more efficiently. Today, for example, the nationwide telecommunications network links thousands of software-controlled electronic systems, making it by far the world's largest distributed processing network. We and our partners—Western Electric and the telephone companies of the Bell System—are putting technology to work so that the network will continue to evolve and expand its information-handling capabilities. The object, of course, is to meet the fast-growing and changing needs of Bell System customers.

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Orders & Installations

Cray Research, Inc. will install a two-million word Cray-1/S computer system, valued at $10.6 million, at the National Magnetic Fusion Energy Computer Center in Livermore, Calif. The computer system initially will be leased, with conversion to purchase expected later this year.

The Sweeney Computing Corp. has received an order from Randolph Surgical Supply Co. for its DRS Order Entry System. Installation is planned for mid-September.

GTE Data Services, a wholly owned subsidiary of General Telephone & Electronics Corp. (GTE), has installed a triple-processor Honeywell, Inc. DPS 8/70 large-scale computer system to provide remote data processing services to GTE's telephone and manufacturing subsidiaries.

Dynamics Research Corp. has installed two Honeywell, Inc. large-scale computers, valued at $2.2 million: a DPS 8/20 and a DPS 8/52 to support the engineering services the systems division provides to the Department of Defense and to its nondefense-oriented customers.

Thomas and Howard Co. has placed an order with Sperry Univac worth $1.4 million, for six Univac System 80 computers, related equipment and software.

Phillips Information Systems, Inc. will design, supply and service the official information processing system, valued at nearly $500,000, for the 1982 World's Fair in Knoxville, Tenn. Micom 2001 and 2002 word processors and software will be provided by Phillips for use in the fair's word processing center and as professional workstations for executives.

Electronic Data Systems Corp. will install and implement a comprehensive computer management system for the Los Angeles County Mental Health Department, which it designed and will develop to give the department immediate access to patient data, provider information and statistics.

Fairchild Camera and Instrument Corp. has ordered two LM-2 machines from Symbolics, Inc., the first in Symbolic's series of Lisp-based computers, to be used with other advanced equipment for research in artificial intelligence at the Fairchild laboratory.

Touche Ross Corp. recently purchased 65 Apple II Plus personal computer systems from Apple Computer, Inc. to be used in the corporation's offices across the country to help increase productivity, lower costs and, in some cases, replace existing use of time-sharing services.

Midlantic Banks, Inc. is equipping teller stations in its 125 offices throughout New Jersey with Bank Control System 90 electronic terminals supplied by Bunker Ramo Corp.

Cobar, Inc. has announced the sale of 10 Model 3100 and 3132 DEC-compatible video terminals to the California Institute of Technology for use in research applications at the institute.

A 1.5 million upgrade of its statewide automated teller machine (ATM) network in Ohio, to be completed by mid-1982, has been started by The Huntington National Bank with the initial installation of 40 Docutel Total Teller 2300 ATMs by Docutel Corp. In addition, City National Bank has placed an order with Docutel for 50 Total Teller 2300 systems, continuing the expansion of its multibank ATM network.

Infotron Systems Corp. has received a $300,000 order from Honeywell, Inc. for 10 Supermux 790 Network Concentrators to expand its Datanetwork service.

Foreign Orders & Installations

The Rickmansworth Data Centre of P&O Computer Services, Ltd., U.K., has installed a Honeywell, Inc. Page Printing System (PPS II).

Electronic Associates, Inc. has shipped a Nuclear Basic Principles Training Simulator to Centrale Nucleaire de Tihange, Belgium, to be used by Tihange as a training tool for power plant operators and nonoperator personnel at its Unit 1 and Unit 2 power stations.

North West Securities, Ltd. of England has ordered two Honeywell DPS 8 large-scale computers plus terminal and communications processor equipment for a new nationwide distributed data processing network.

Apollo Computer, Inc. has recently installed its first international Domain Processing System at Rutherford Laboratory, Oxfordshire, England, to be used as part of the Science and Engineering Research Council's Distributed Processing Systems Facility.

Hogan Associates, Inc. has signed contracts valued at more than $750,000 with Australian Bank Ltd. and the Commercial Bank of Australia, Ltd., both of whom have contracted for the Hogan Integrated Deposits System.

General Instrument Corp. has been awarded a $5 million contract by the Witwatersrand Association of Racing Clubs in Johannesburg, South Africa, to install a computerized pari-mutuel wagering system. The system will serve the four major racetracks in the Transvaal region of South Africa.

Bunker Ramo Corp. has installed its Bank Control System 90 on-line transaction processing system at the offices of Banco de Chile, Santiago, Chile.

Sperry Univac Corp. has announced System 80 orders from the following companies: Herbert France, headquartered in Mantes la Jolie, France; Ober-France, based in Bar le Duc, France; Asco, headquartered in Juziers, France; Scandinavian Fish based in Ecquevilly, Yvelines, France; Toei Co., Ltd. of Tokyo; and Japan Novopan Industrial Co. of Osaka, Japan.

Cromemco, Inc. and Information Management International (IMI) have signed a contract valued at more than $1 million for Cromemco's multiuser, multitasking Cromix systems to be used by IMI's French affiliate, Societe Generale de Service et de Gestion, a consulting and data services company.

Electronic Associates, Inc. (EAI) has received approval of an export license from the U.S. Department of Commerce for a major analog/hybrid/computer system to be provided to the People's Republic of China (PRC). The EAI Hyshare 700 System, including both digital and analog computers, is the first such large analog/hybrid system purchased by the PRC and is to be used for simulation studies and a wide range of dynamic systems analyses at the University of Harbin, Harbin, PRC.

Sperry Univac, a division of the Sperry Corp., has installed a large-scale Univac 1100/60 computer system valued at $1.3 million at the Tonami Transportation Co. in Japan. In addition, Matsushita Electronic Parts Co. has acquired a large-scale Univac 1100/62 model valued at $3.4 million to serve as the hub of the company's newly implemented centralized distributed network system.

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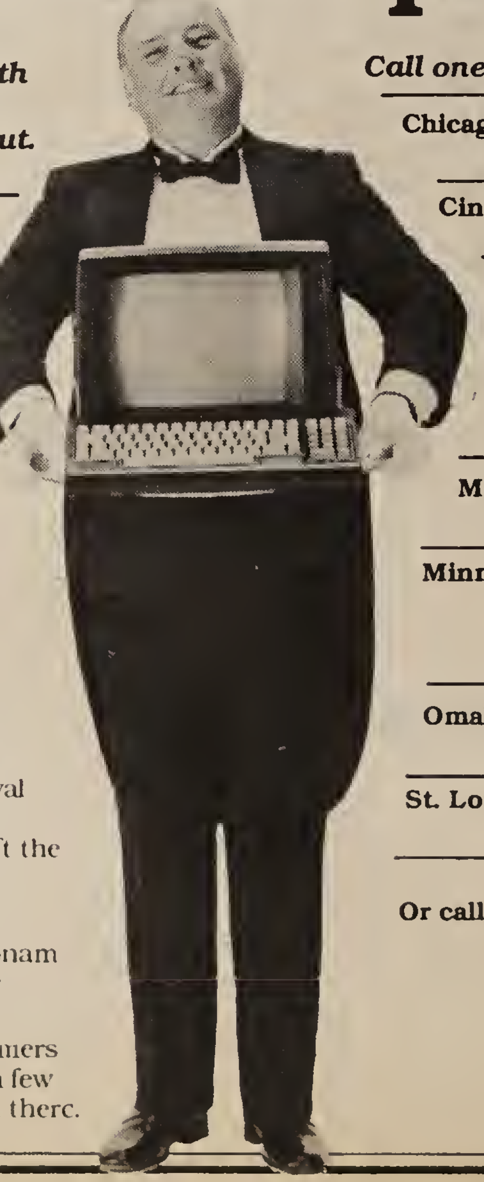

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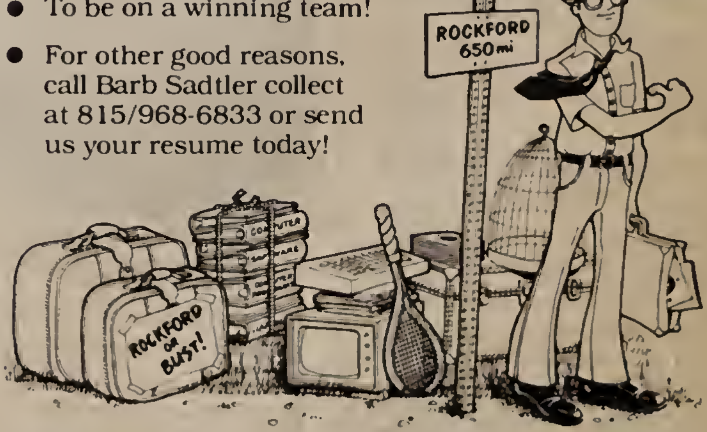

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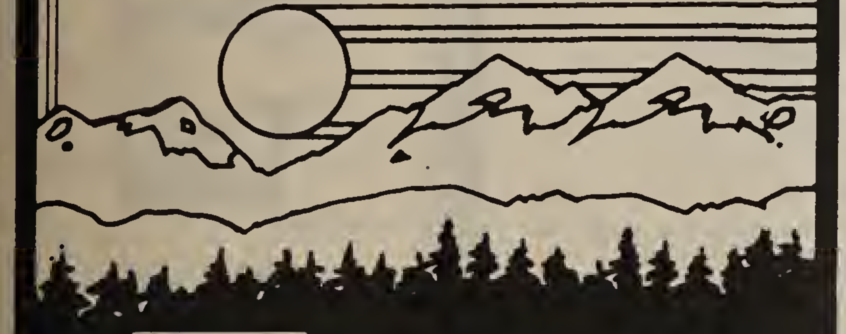

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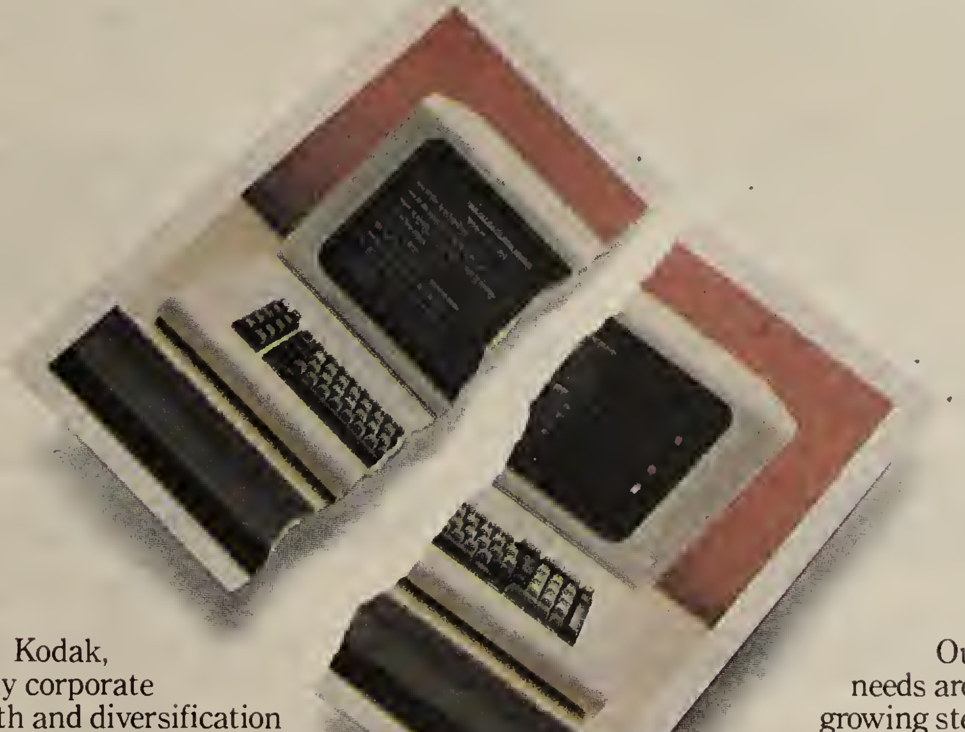

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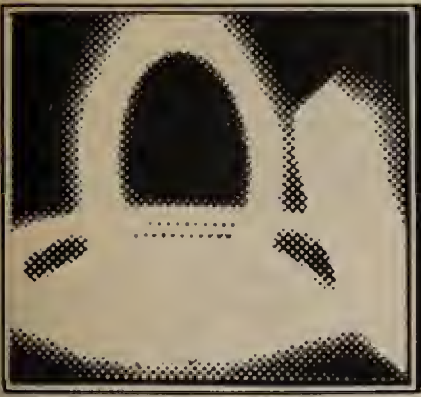

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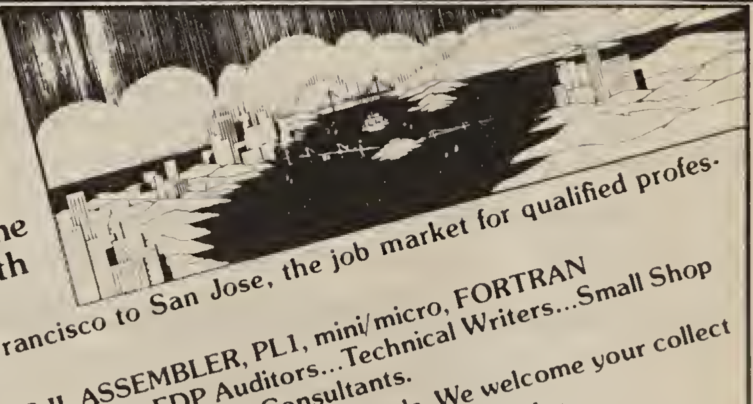

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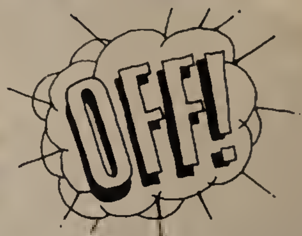

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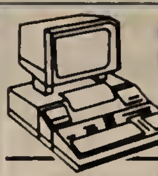

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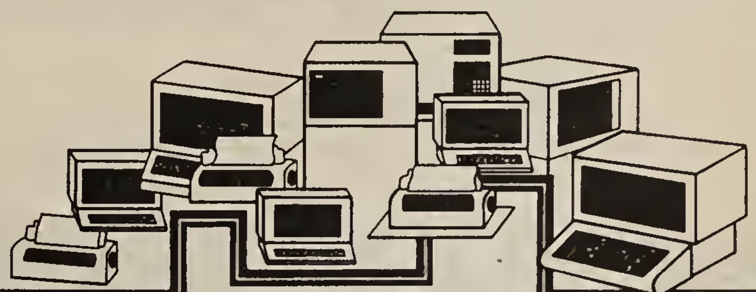

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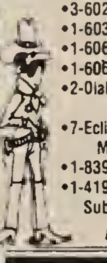

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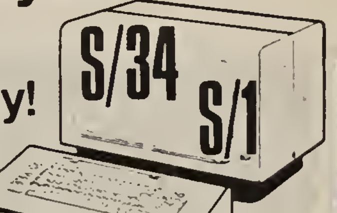

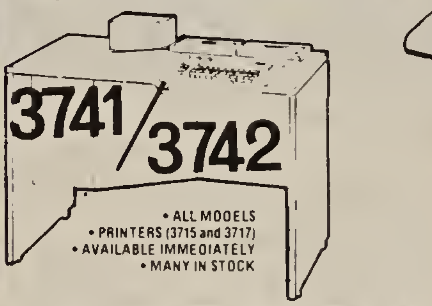

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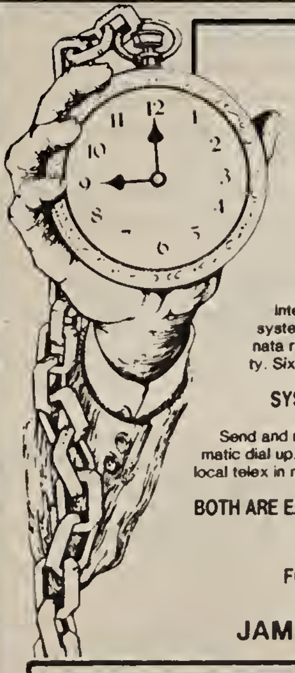

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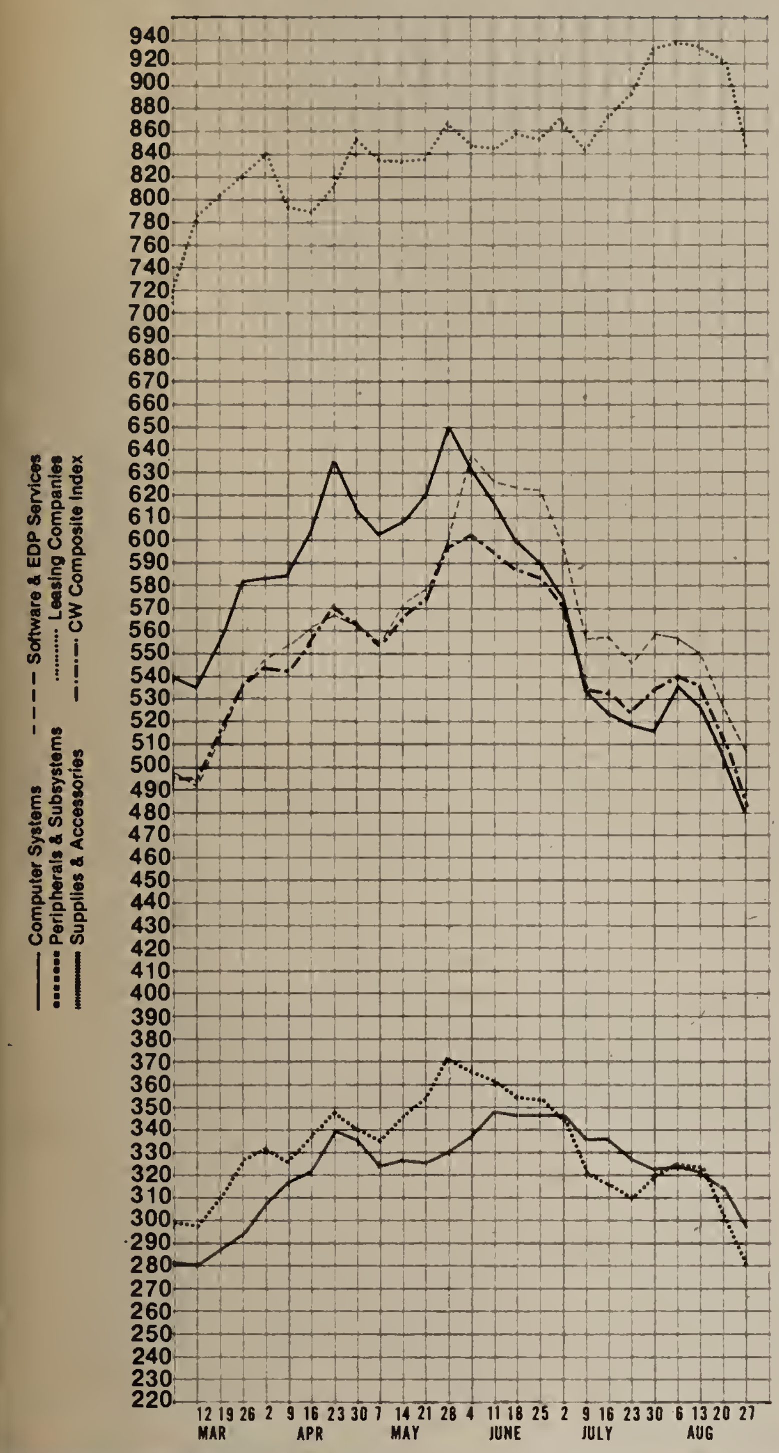
Computerworld Stock Trading Index



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TRADE°QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, AUGUST 26, 1981

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

EXCH		PRICE			
		1980-81 RANGE (1)	CLOSE AUG 26 1981	WEEK NET CHNGE	WEEK PCT CHNGE
	COMPUTER SYSTEMS				
A	AMDAHL CORP	23- 46	30 1/2	- 1/2	-1.6
N	BURROUGHS CORP	34- 72	35 3/8	+1	+2.9
O	COMPUTER AUTOMATION	10- 28	10 1/2	- 3/4	-6.6
N	CONTROL DATA CORP	60- 84	67 3/4	-2 7/8	-4.0
N	CRAY RESEARCH INC	29- 49	29 1/4	-1	-3.3
N	DATA GENERAL CORP	46- 87	50	-3 7/8	-7.1
N	DATAPOINT CORP	43- 68	46 1/4	-4 1/2	-8.8
N	DIGITAL EQUIPMENT	80-113	91 3/4	-4 1/2	-4.6
A	EECO INC	10- 19	9 7/8	-1 3/4	-15.0
N	ELECTRONIC ASSOC.	7- 13	6 1/2	- 3/8	-5.4
N	FOUR-PHASE SYSTEMS	18- 46	31 3/4	-1 7/8	-5.5
N	FOXBORO	46- 62	49 7/8	-1 3/8	-2.6
O	GENERAL AUTOMATION	7- 16	10	-1 5/8	-13.9
O	GRI COMPUTER CORP	1- 3	1 1/4	0	0.0
N	HARRIS CORP	41- 60	43	- 1/4	-0.5
N	HEWLETT-PACKARD CO	33- 54	44	-1 5/8	-3.5
N	HONEYWELL INC	82-115	88 1/8	-1 7/8	-2.0
N	IBM	55- 73	55 1/2	-1 1/2	-2.6
O	MAGNUSON COMP SYSTS	16- 32	15 1/2	-2 1/4	-12.6
N	MANAGEMENT ASSIST	11- 26	12 1/8	- 3/8	-3.0
O	MINI-COMPUTER SYST	1- 4	1 5/8	0	0.0
N	MODULAR COMPUTER SYS	9- 32	8 5/8	- 7/8	-9.2
N	MOHAWK DATA SCI	16- 32	16 3/8	0	0.0
N	NCR	55- 76	55 3/8	- 7/8	-1.5
N	PRIME COMPUTER INC	22- 49	23 1/8	- 7/8	-3.6
N	PERKIN-ELMER	23- 36	23 1/8	- 7/8	-3.6
N	SPERRY CORP	37- 65	36 3/4	-3 1/2	-8.6
O	TANDEM COMPUTERS INC	13- 35	27 3/4	-2	-6.7
N	TEXAS INSTRUMENTS	85-151	86	-6	-6.5
A	WANG LABS.	24- 46	24 1/4	-4	-14.1
	LEASING COMPANIES				
O	BOOTHE FINANCIAL CP	18- 29	27 1/2	+ 1/4	+0.9
N	COMDISCO INC	17- 24	17 3/8	-2 5/8	-13.1
O	COMMERCE GROUP CORP	1- 2	1	- 1/4	-20.0
O	COMPUTER INVSTRS GRP	1- 4	5/8	0	0.0
O	CONTINENTAL INFO SYS	4- 9	7	- 3/4	-9.6
A	DCL INC	3- 4	3 1/4	0	0.0
N	DPF INC	5- 12	9 5/8	- 1/4	-2.5
O	ITEL	1- 15	3/4	- 1/8	-14.2
O	LEASPAC CORP	1- 2	3/8	0	0.0
A	PIONEER TEX CORP	2- 6	3 5/8	-1 1/2	-29.2
N	RELIANCE GROUP INC	65- 99	86 3/4	-3 7/8	-4.2
N	U.S. LEASING	18- 30	22	-1 3/8	-5.8
	SOFTWARE & EDP SERVICES				
O	ADVANCED COMP TECH	3- 6	4 1/2	- 1/4	-5.2
O	ADVANCED SYSTEMS INC	10- 15	11 3/4	- 1/4	-2.0
O	ANACOMP INC	13- 19	14 3/4	- 3/4	-4.8
O	ANALYSTS INTL CORP	3- 14	5 3/4	0	0.0
A	APPLIED DATA RES.	15- 25	16	-1 1/2	-8.5
N	AUTOMATIC DATA PROC	22- 32	28 3/8	-1 1/4	-4.2
O	CGA COMPUTER ASSOC	7- 25	6 1/2	- 1/2	-7.1
O	COMPUTER HORIZONS	1- 5	2 3/4	- 1/4	-8.3
O	COMPUTER NETWORK	4- 9	4 1/2	- 1/8	-2.7
N	COMPUTER SCIENCES	16- 30	17	+ 1/4	+1.4
O	COMPUTER TASK GROUP	13- 23	16 3/4	- 1/4	-1.4
O	COMPUTER USAGE	3- 10	2 7/8	- 1/4	-8.0
O	COMSHARE	10- 21	9 3/4	+ 1/4	+2.6
O	CULLINANE DATABASE	29- 69	50 1/2	-4	-7.3
O	DATA DIMENSIONS INC	1- 4	1 1/8	0	0.0
O	DATATAB	2- 4	2 1/4	0	0.0
O	DSI CORP	4- 9	5 7/8	+ 3/8	+6.8
O	DYATRON CORP	5- 11	5 1/2	0	0.0
N	ELECTRONIC DATA SYST	15- 30	25 1/4	-2 1/8	-7.7
O	INFORMATICS INC	17- 34	20	-2	-9.0
O	INSYTE CORP	1- 3	2 1/2	+ 1/8	+5.2
O	IPS COMPUTER MARKET.	1- 4	1 3/4	0	0.0
O	KEANE ASSOCIATES	4- 8	6	- 1/2	-7.6
A	LOGICON	23- 38	30 3/4	- 3/4	-2.3
O	MNGT SCI AMER INC	17- 26	18 3/4	-1 1/2	-7.4
O	MATHEMATICA INC	12- 19	13 3/4	-1 1/4	-8.3
O	MATHEMATICAL APP GRP	15- 28	19	0	0.0
O	NATIONAL DATA CORP	14- 28	18 1/8	+ 1/8	+0.6
N	PLANNING RESEARCH	6- 13	5 3/4	- 5/8	-9.8
O	PROGRAMMING & SYS	1- 2	1 5/8	0	0.0
O	RAPIDATA INC	6- 11	6	- 1/2	-7.6
O	REYNOLDS & REYNOLD	18- 26	18 3/4	- 3/4	-3.8
O	SEI CORP	17- 28	22 1/4	-1 3/4	-7.2
O	STSC INC	9- 28	9 1/4	-2 1/4	-19.5
O	SCIENTIFIC COMPUTERS	8- 16	9	+ 1/4	+2.8
O	SOFTWARE AG	15- 23	14 1/2	-2	-12.1
N	TYMSHARE INC	34- 58	34 3/8	-2	-5.4
A	URS CORP	13- 18	12 7/8	- 1/4	-1.9
N	WYLY CORP	9- 20	9 3/8	- 1/8	-1.3
	PERIPHERALS & SUBSYSTEMS				
N	AM INTERNATIONAL	11- 25	12 1/4	- 1/4	-2.0
A	ANDERSON JACOBSON	13- 26	14 3/4	-3	-16.9
O	AUTO-TROL TECHNOLOGY	11- 62	11 1/2	- 3/4	-6.1
O	BEEHIVE INT'L	10- 18	9 3/4	-1 1/4	-11.3
A	BOLT,BERANEK & NEW	16- 25	16 1/2	-2 1/4	-12.0
O	CAMBEX CORP	2- 9	3 7/8	- 1/4	-6.0
N	CENTRONICS DATA COMP	8- 40	8 3/8	-1 3/8	-14.1
A	CETEC CORP	5- 9	5	- 1/8	-2.4
O	COMPUTER DEVICES INC	6- 10	6 5/8	- 3/8	-5.3
O	COGNITRONICS	5- 11	6 5/8	- 7/8	-11.6
O	COMPUTER COMMUN.	1- 8	1 1/4	- 3/8	-23.0
A	COMPUTER CONSOLES	20- 28	22 1/8	-2	-8.2
O	COMPUTER TRANSCEIVER	3- 9	8	+ 7/8	+12.2
N	COMPUTERVISION CORP	20- 49	37	-2 3/8	-6.0
N	CONRAC CORP	17- 28	23 1/8	+ 1/8	+0.5
A	DATA ACCESS SYSTEMS	6- 23	6 1/2	-2 3/8	-26.7
A	DATAPRODUCTS CORP	24- 44	24 3/8	-3	-10.9
O	DATUM INC	2- 5	2	- 1/4	-11.1
O	DECISION DATA COMPUT	3- 6	3	- 1/8	-4.0
O	DELTA DATA SYSTEMS	2- 4	2 7/8	- 5/8	-17.8
O	DATARAM CORP	6- 15	6	-1 1/8	-15.7
N	ELECTRONIC M & M	4- 9	4 1/8	- 1/4	-5.7
O	EVANS & SUTHERLAND	18- 40	27 1/2	+ 1/4	+0.9
O	FABRI-TEK	2- 6	3 3/4	0	0.0
O	GENERAL COMPUTER SYS	1- 12	7 3/4	- 1/4	-3.1
N	GEN'L DATA COMM IND	10- 19	10 1/4	- 3/8	-3.5
O	GENERAL TERMINAL CP	1- 4	1	0	0.0
N	HAZELTINE CORP	20- 35	23 7/8	- 3/8	-1.5
O	INFORMATION INTL INC	8- 17	10 3/4	-2	-15.6
O	INTEL CORP	29- 51	28 1/2	-2 1/4	-7.3
O	IPL SYSTEMS INC	10- 15	9 1/2	- 1/4	-2.5
A	LUNDY ELECTRONICS	9- 18	10 3/4	-1 1/8	-9.4
A	MSI DATA CORP	11- 27	15 5/8	-1 1/2	-8.7
N	MEMOREX	8- 18	12	0	0.0
O	NETWORK SYSTEMS CORP	17- 25	17 1/4	- 3/4	-4.1
O	OMEX	2- 12	12	0	0.0
N	PARADYNE CORP	25- 52	38 1/4	-2 5/8	-6.4
A	PENRIL CORP	11- 17	10 1/2	0	0.0
O	RAMTEK CORP	10- 23	13 3/8	- 3/4	-5.3
N	RECOGNITION EQUIP	9- 21	8 1/2	-1 7/8	-18.0
O	SCAN DATA	1- 5	1 3/4	- 1/4	-12.5
N	STORAGE TECHNOLOGY	18- 36	30 1/2	- 1/2	-1.6
O	SYKES DATATRONICS	8- 29	19 1/4	-1 1/2	-7.2
A	T BAR INC	12- 19	12 1/2	-1 1/4	-9.0
A	TEC INC	4- 7	4 3/4	- 5/8	-11.6
N	TEKTRONIX INC	47- 70	48 1/8	-2 1/4	-4.4
N	TELEX	5- 9	5 3/8	- 3/8	-6.5
O	TESDATA SYSTEMS CP	8- 17	7 7/8	- 5/8	-7.3
A	TIMEPLEX INC	10- 19	11	+ 1/8	+1.1
O	WILTEK INC	1- 3	1 5/8	- 1/8	-7.1
	SUPPLIES & ACCESSORIES				
N	AMERICAN BUS PRODS	12- 17	12 1/4	- 3/8	-2.9
O	BALTIMORE BUS FORMS	1- 2	7/8	- 1/4	-22.2
N	BARRY WRIGHT	17- 24	17 5/8	-1	-5.3
O	CYBERMATICS INC	1- 2	1 1/8	0	0.0
A	DUPLEX PRODUCTS INC	12- 17	13 7/8	- 1/2	-3.4
N	FNNIS BUS. FORMS	15- 23	18 3/4	- 1/4	-1.3
N	3M COMPANY	50- 65	50 1/2	-1	-1.9
O	MOORE CORP LTD	27- 38	32	- 1/4	-0.7
N	NASHUA CORP	18- 33	19 1/4	0	0.0
O	STANDARD REGISTER	30- 41	34 3/4	-1 1/4	-3.4
A	TAB PRODUCTS CO	16- 30	17 7/8	-1 1/2	-7.7
N	WALLACE BUS FORMS	22- 31	26	-1 5/8	-5.8

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(1) TO NEAREST DOLLAR

Looking for a quiet, tough printer system? Southern Systems has it. The QT Family.

People have been talking about The QT for a long time. They didn't call it The QT, of course. They just talked about the ideal line printer system — one that would be both durable and easy to operate, a low-cost system with great versatility and dependability. Give us a line printer system, they said, with one answer to my most important needs:

YES

- ☑ Do the QT printer systems give me a choice of 300, 600, 1000 & 1200 lpm?
- ☑ Does the QT family set the standard for quietness?
- ☑ Are they built for production DP applications?
- ☑ Are the bands heavy duty steel? Operator changeable?
- ☑ Are they easy to maintain?
- ☑ Is the print quality top-caliber?
- ☑ Is there a diagnostic display? Internal self test?
- ☑ Towel ribbon? Forms alignment? Membrane touch control?
- ☑ Does SSI guarantee compatibility with my computer?
- ☑ Is service available nationwide?
- ☑ Is the QT line printer family affordable and cost-effective?

There's just one other answer you might need: "Delivery in approximately 30 days."

Tell me about your printers from:
__ 200-300 lpm __600-900 lpm __1000-plus lpm
__Parallel interfacing __Serial interfacing (Synchronous or asynchronous)

My computer system is ____________________

Name ____________________

Title ____________________

Company ____________________

Address ____________________

City __________ State __________ Zip __________

Telephone ____________________ CW

SSi

Southern Systems

The Printer System Problem-Solvers.

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